

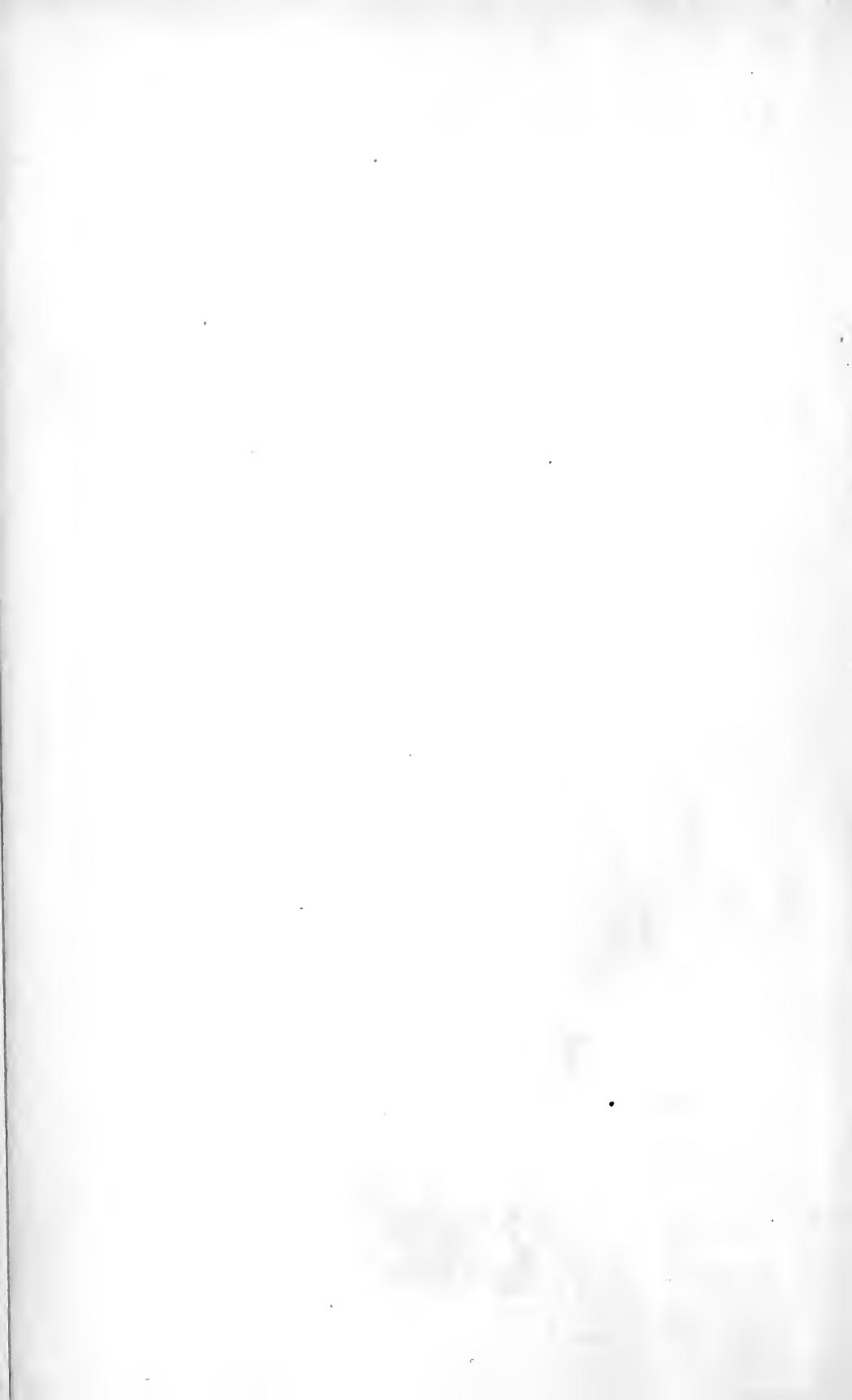
LOGARITHMIC
AND
TRIGONOMETRIC
TABLES

WILCZYNSKI — SLAUGHT

ALLYN AND BACON

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LOGARITHMIC AND TRIGONOMETRIC T A B L E S

COMPILED BY

E. J. WILCZYNSKI, PH.D.
THE UNIVERSITY OF CHICAGO

EDITED BY

H. E. SLAUGHT, PH.D.
THE UNIVERSITY OF CHICAGO



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PREFACE

THESE tables are intended primarily for use in connection with our *Plane Trigonometry and Applications*. But they may be used equally well with other texts, and for the purposes of surveying and engineering practice. We believe that they have the following advantages over other similar compilations.

1. *The typography and spacing.* Continued use of numerical tables is usually hard on the eyes. We have attempted to relieve the strain on the computer's eyes by the use of generous spacing and variety of type.

2. *The presence of Table III.* Most collections of tables either make no provision at all for the logarithms of the functions of small angles, or else depend entirely on the use of the auxiliaries *S* and *T*, which are apt to be somewhat obscure to the beginner.

3. *Table IV, for the auxiliaries S and T,* has been calculated on the assumption that the angle is expressed in minutes. In most other collections, these quantities are tabulated for angles expressed in seconds, which is far less convenient for most purposes.

4. *A table of the values of the natural functions* to five decimal places is practically useless, unless the computer has access to large product tables, or uses a computing machine. We have therefore inserted a four-place table of the natural functions, giving their values for every tenth of a degree.

5. *The table of squares in any collection* should permit the same degree of accuracy as the corresponding table of natural functions. We have therefore included a four-place table of squares (reproduced from Bremiker), arranged just like a table of logarithms and in a form actually adapted to trigonometric work rather than to the theory of numbers. Most of the tables of squares which have appeared in our trigonometries are so cumbersome and inconvenient as to be practically useless.

6. *The three-place tables IX, X, and XI* are, on account of their compactness, especially useful for calculations involving no more than three digits. By means of these tables a somewhat greater accuracy, and about the same speed may be attained as with the ordinary size of slide rule. They have the further advantage of enabling the computer to avoid a considerable part of the strain which careful slide rule work produces upon the eye.

In compiling this work, use has been made of various standard tables, notably those of Bremiker.

E. J. WILCZYNSKI,
H. E. SLAUGHT, EDITOR.

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INTRODUCTION TO THE TABLES

TABLE I

1. Definition of a common logarithm. *The common logarithm of any positive number N is the exponent of the power to which the base 10 must be raised in order to produce the number N .*

2. Properties of logarithms. The following properties of logarithms are of importance for the purposes of numerical calculation.*

1. *The logarithm of a product is equal to the sum of the logarithms of its factors.*

2. *The logarithm of a quotient is equal to the logarithm of the dividend minus the logarithm of the divisor.*

3. *The logarithm of the p^{th} power of a number M is obtained by multiplying the logarithm of M by p .*

4. *The logarithm of the n^{th} root of a number M is obtained by dividing the logarithm of M by n .*

5. *The logarithm of ten is equal to unity.*

6. *The logarithm of unity is equal to zero.*

The positive integral powers of 10, such as 10, 100, 1000, etc., the negative integral powers of 10, such as 0.1, 0.01, 0.001, etc., and the zero power of 10, which is equal to 1, are the only numbers whose common logarithms are integers. The logarithms of all other numbers have an integral and a fractional part.

The fractional part of the logarithm is called the mantissa, while the integral part of the logarithm is known as its characteristic.

3. Properties of the mantissa. We consider the mantissa and the characteristic separately because, in practice, the method for finding the characteristic of a logarithm is entirely different from that employed for finding its mantissa. The reason for this will appear from the following discussion.

* For a proof of these properties, see *Plane Trigonometry and Applications*, by E. J. WILCZYNSKI, edited by H. E. SLAUGHT.

Let us grant that we have found out in some way that

$$(1) \quad \log 1.77828 = 0.25000.$$

From the theorem about the logarithm of a product, we conclude

$$\begin{aligned} \log 17.7828 &= \log (1.77828 \times 10) = \log 1.77828 + \log 10 \\ &= 0.25000 + 1 = 1.25000, \end{aligned}$$

$$\begin{aligned} \log 177.828 &= \log (1.77828 \times 100) = \log 1.77828 + \log 100 \\ &= 0.25000 + 2 = 2.25000, \end{aligned}$$

.

We observe that the numbers 1.77828, 17.7828, 177.828, etc., contain the same succession of digits, and differ from each other only in the position of the decimal point. Their logarithms, on the other hand, whose values we have just calculated, differ from each other only in the value of the characteristic.

Again, if we make use of the theorem about the logarithm of a quotient, we find from (1)

$$\log 0.177828 = \log \frac{1.77828}{10} = 0.25000 - 1,$$

$$\log 0.0177828 = \log \frac{1.77828}{100} = 0.25000 - 2,$$

.

Now, the negative quantities, which appear on the right members of these equations, are not written in the form which we ordinarily use for negative quantities. Thus, for instance, we have found the value of $\log 0.0177828$ to be $0.25000 - 2$, a result which we should ordinarily write in the form -1.75000 to which it is obviously equal. If we agree to write every negative logarithm in this unusual form, as a difference between a *positive proper fraction* and an integer, thus making its fractional part positive, we gain the advantage that the mantissas will be the same for any two numbers which contain the same succession of digits, even if none of these digits appear to the left of the decimal point. We avoid, in this way, the necessity of using two different tables of mantissas, one for numbers greater and one for numbers less than unity.

Let us recapitulate the result of our discussion in two formal statements.

I. *We agree to express the logarithm of any positive number N in such a form that its mantissa shall be positive.*

This can be done whether $\log N$ is positive or negative, that is, whether N be greater or less than unity. In the latter case, the negativeness of $\log N$ is brought about entirely by means of the negative characteristic.

As a consequence of this agreement, the following statement will be true in all cases.

II. If two numbers contain the same succession of digits, that is, if they differ only in the position of the decimal point, their logarithms will have the same mantissa and will differ only in the value of the characteristic.

It is for this reason that the tables give only the *mantissas* of the logarithms and that, in looking up the mantissas, we pay no attention to the position of the decimal point in the given number.

4. Determination of the characteristic. The characteristic of a logarithm is easily determined by inspection. Its value depends merely on the position of the decimal point. Since we have

$$10^0 = 1, 10^1 = 10, 10^2 = 100, 10^3 = 1000, \text{ etc.},$$

or

$\log 1 = 0$, $\log 10 = 1$, $\log 100 = 2$, $\log 1000 = 3$, etc.,

we draw the following conclusions:

If $1 < N < 10$, then $0 < \log N < 1$. $\therefore \log N$ has the characteristic 0.

If $10 < N < 100$, then $1 < \log N < 2$ $\log N$ has the characteristic 1.

If $100 < N < 1000$, then $2 < \log N < 3$. $\therefore \log N$ has the characteristic 2.

If $10^k < N < 10^{k+1}$, then $k < \log N < k + 1$. $\therefore \log N$ has the characteristic k .

We may formulate these results as follows :
 III. *If k is a positive integer, and if the number N lies between 10^k and 10^{k+1} , the characteristic of $\log N$ is equal to k .*
 Since such a number N has $k + 1$ digits to the left of the

IV. *If N is any number greater than 1, the characteristic of its logarithm is one less than the number of digits in its integral part.*

The student is advised to make but little use of this rule on account of its mechanical character. Statement III provides a better method (less mechanical and easier to remember), for determining the characteristic.

It remains to show how to find the characteristic of $\log N$ when $N < 1$.

If $.1 < N < 1$, then $-1 < \log N < 0$. $\therefore \log N$ has the characteristic -1 .

If $.01 < N < .1$, then $-2 < \log N < -1$. $\therefore \log N$ has the characteristic -2 .

If $.001 < N < .01$, then $-3 < \log N < -2$. $\therefore \log N$ has the characteristic -3 .

If $\frac{1}{10^{k+1}} < N < \frac{1}{10^k}$, then $-(k+1) < \log N < -k$. $\therefore \log N$ has the characteristic $-(k+1)$.

Examination of this table leads to the following two statements, either of which may be used to determine the characteristic of $\log N$ when $N < 1$.

If k is a positive integer, and if the number N lies between $\frac{1}{10^k}$ and $\frac{1}{10^{k+1}}$ the characteristic of $\log N$ is $-(k+1)$.

If N is less than 1, and if there are k zeros between the decimal point and the first significant figure of N when N is expressed as a decimal fraction, the characteristic of its logarithm is $-(k+1)$.

In one of our illustrations we had found

$$\log 0.0177828 = 0.25000 - 2.$$

We must never write this in the form

$$\log 0.0177828 = -2.25000,$$

since only the characteristic is negative and not the fractional part. Some computers use the notation

$$\log 0.0177828 = \bar{2}.25000;$$

but for most purposes it is preferable to write

$$\log 0.0177828 = 8.25000 - 10,$$

and similarly

$$\log 0.177828 = 9.25000 - 10.$$

In other words, *in actual practice, we write a positive characteristic $10 - k$ in place of the negative characteristic $-k$, and then subtract 10 from the whole logarithm.*

5. Arrangement and use of the table of logarithms. We have already mentioned the fact that the table of logarithms gives only the mantissas. The characteristics must be supplied by the computer by the methods of Art. 4.

Table I gives the mantissa, for every number from 1 to 9999, to five decimal places. In order to explain the arrangement and use of this table, we shall now solve a number of typical examples.

PROBLEM 1. Find the logarithm of 221.4.

Solution. To find the mantissa we ignore the decimal point. We read down the left-hand column of the table (headed N) until we find the first three digits of our number, viz.: 221. The numbers printed in the same horizontal row with 221 are, in order, the mantissas of the logarithms of 2210, 2211, 2212, ..., 2219, as indicated by the number at the head of each of the next ten columns. To save space, however, the first two digits of the mantissa are never printed more than once in each row. In our case we find the mantissa, from the column headed 4, to be .34518. Since 221.4 is between $100 = 10^2$ and $1000 = 10^3$, the characteristic is 2. Therefore

$$\log 221.4 = 2.34518.$$

PROBLEM 2. Find $\log 22.39$.

Solution. Looking for the mantissa as before, we find *005. The asterisk indicates that the first two digits of the mantissa are not 34, as one might suppose, but 35. The reason for this appears clearly from the table. Therefore

$$\log 22.39 = 1.35005.$$

If the number N contains more than four digits its logarithm cannot be read directly from the table. But it may be found by **interpolation**. We illustrate this process by an example.

PROBLEM 3. Find $\log 222.73$.

Solution. From the table we find, supplying the characteristics ourselves,

$$\log 222.70 = 2.34772$$

$$\underline{\log 222.80 = 2.34792}$$

Tabular difference = 0.00020 = 20 units of the fifth decimal place. Since 222.73 is $\frac{3}{10}$ of the way from 222.70 toward 222.80 we add $\frac{3}{10}$ of the tabular difference to $\log 222.70$. Therefore

$$\log 222.73 = 2.34772 + \frac{3}{10} \text{ of } 0.00020,$$

or

$$\log 222.73 = 2.34772 + 0.00006 = 2.34778.$$

The auxiliary tables in the margin, headed P P (abbreviation for proportional parts), facilitate the process of interpolation.

Thus, in problem 3, we refer to the auxiliary table with 20 (the tabular difference) at its head. In the third row we find $\frac{7}{10}$ of 20 or 6.0.

It remains to show how to find the number when its logarithm is given.

PROBLEM 4. Given $\log N = 9.34857 - 10$. Find the value of N to five significant figures.

Solution. The characteristic of $\log N$ is $9 - 10$ or -1 . Therefore, the number N must be between $10^{-1} = 0.1$ and $10^0 = 1$. Consequently, the decimal point will precede the first significant figure of N .

The mantissa 34857 does not occur in the table, but it falls between the two tabular mantissas 34850 and 34869. Thus we have:

$$9.34850 - 10 = \log 0.22310 \text{ (from the table),}$$

$$9.34857 - 10 = \log N,$$

$$9.34869 - 10 = \log 0.22320 \text{ (from the table),}$$

so that N lies between 0.22310 and 0.22320.

We observe that $\log N$ lies $\frac{7}{10}$ of the way from $\log 0.22310$ toward $\log 0.22320$. Therefore, N lies $\frac{7}{10}$ of the way from 0.22310 toward 0.22320. That is,

$$N = 0.22310 + \frac{7}{10} \text{ of 10 units of the fifth decimal place.}$$

But

$$\frac{7}{10} \text{ of 10 units} = \frac{7}{10} \text{ units} = 3\frac{1}{10} \text{ units.}$$

Since $\frac{1}{10}$ is more than one half, we call this 4 units, so that

$$N = 0.22310 + 0.00004 = 0.22314.$$

Also in this inverse problem (to find the number when its logarithm is given), interpolation is aided by the auxiliary tables in the margin.

Thus, in problem 4, the tabular difference is 19. The difference between $\log N$ and the smaller of the two tabular logarithms, between which $\log N$ lies, is 7. The auxiliary table with 19 at its head shows that, among the tenths of 19, that one which comes closest to the value 7 is the fourth. Consequently, N is $\frac{4}{10}$ of the way from 0.22310 toward 0.22320. Therefore, up to five decimal places, $N = 0.22310 + 0.00004 = 0.22314$.

6. Cologarithms. Since we obtain the same result whether we divide N by M , or multiply N by $1/M$, we may, in a logarithmic calculation, add the logarithm of $1/M$ instead of subtracting $\log M$. *The logarithm of $1/M$ is called the cologarithm of M .* Therefore

$$\text{colog } M = \log \frac{1}{M} = \log 1 - \log M = -\log M,$$

since $\log 1$ is equal to zero.

Cologarithms, like logarithms, are written with a positive mantissa. Consequently, the cologarithm of a number is most easily found by subtracting its logarithm from zero,

written in the form $10.00000 - 10$, as in the following example.

PROBLEM 5. Find the cologarithm of 222.73.

Solution.

$$\begin{array}{r} 10.00000 - 10 \\ \log 222.73 = 2.34778 \\ \hline \log 222.73 = 7.65222 - 10 \end{array}$$

It is easy to perform this operation of subtraction from $10.00000 - 10$ mentally. There is no gain, however, from the use of cologarithms when we are dealing with a quotient of only two numbers. A real advantage is gained by the introduction of cologarithms, when more than two logarithms are to be combined by addition and subtraction. For the logarithms which are to be subtracted we then substitute cologarithms, enabling us to complete the operation by a single addition.

It often happens, just as in the case of forming a cologarithm, that we wish to subtract a logarithm from another smaller one. In all such cases we change the form of the minuend by adding and subtracting 10, or some convenient multiple of 10, as in the following example.

PROBLEM 6. Compute $\frac{32.34}{472.3}$.

Solution. We find from Table I,

$$\begin{array}{rcl} \log 32.34 & = & 1.50974, \\ \log 472.3 & = & 2.67422. \end{array}$$

In order to subtract the latter logarithm from the former, we write

$$\begin{array}{r} \log 32.34 = 11.50974 - 10, * \\ \log 472.3 = 2.67422 \\ \hline \log \frac{32.34}{472.3} = 8.83552 - 10 \end{array}$$

Hence (from the table), $\frac{32.34}{472.3} = 0.068173$.

7. Extraction of roots by means of logarithms. Since

$$\log \sqrt[p]{x} = \log x^{1/p} = \frac{1}{p} \log x,$$

it is easy to extract roots of any order by means of logarithms. If the characteristic of $\log x$ is not negative, no further remark is necessary. If $\log x$ is negative, we proceed as in the following example :

* A computer with some experience will refrain from actually writing the logarithm in the form $11.50974 - 10$. It is easy for him to carry out the calculation *as though* it were so written.

PROBLEM 7. Compute by logarithms: $\sqrt{.53760}$, $\sqrt[3]{.53760}$, and $\sqrt[5]{.53760}$.

Solution. $\log 0.53760 = 9.73046 - 10$.

$$\log \sqrt{.53760} = \frac{1}{2} \log 0.53760 = \frac{1}{2} (19.73046 - 20) = 9.86523 - 10.$$

$$\log \sqrt[3]{.53760} = \frac{1}{3} \log 0.53760 = \frac{1}{3} (29.73046 - 30) = 9.91015 - 10.$$

$$\log \sqrt[5]{.53760} = \frac{1}{5} \log 0.53760 = \frac{1}{5} (49.73046 - 50) = 9.94609 - 10.$$

Therefore, from Table I,

$$\sqrt{.53760} = .73322, \sqrt[3]{.53760} = .81312, \sqrt[5]{.53760} = .88326.$$

8. Logarithmic calculations which involve negative numbers.

We have defined only the logarithms of positive numbers. But this suffices for our purposes. Clearly, when we compute a product or quotient, its numerical value may be found first, without paying any attention to the signs of the various factors. Afterwards, the proper sign (+ or -) may be prefixed to the result according as there were an even or odd number of negative factors.

The easiest way to keep a count of the negative factors is to use the method, introduced by GAUSS, of writing the letter *n* immediately behind a logarithm which corresponds to a negative number. In forming a sum or difference of logarithms, we write an *n* after the result only if an *odd* number of the separate logarithms were affected by an *n*.

EXAMPLE. If $N = - 221.73$, we write

$$\log N = 2.34778 \text{ } n.$$

TABLE II

Table II gives the values of the logarithms of the trigonometric functions, to five decimal places, for every minute of arc. If the angle contains fractional parts of a minute, we obtain its functions from the table by interpolation.

The arrangement of this table resembles that of the table of natural functions so closely that it is unnecessary to describe it in detail. (Compare the description of Table V.) It should be noted, however, that, in this table, the characteristics of the logarithms are also given. But since the natural sines and cosines of all acute angles, and the tangents of all angles less than 45° , are proper fractions, their characteristics are negative and have been expressed in the form $9 - 10$, $8 - 10$, etc. *The continually recurring - 10 has not been printed*, and should be supplied by the computer. It is

understood, once for all, that 10 is to be subtracted from all of the logarithms in the first, second, and fourth columns of the table, while the logarithms printed in the third column are provided with their correct characteristic and require no such modification.

The process of interpolation may be applied to the table of logarithms of the trigonometric functions in the same way as to the table of natural functions or to the table of logarithms of numbers.

The following examples are intended to illustrate the application of Table II.

EXAMPLE 1. Find $\log \sin$, $\log \cos$, $\log \tan$, $\log \cot$ of $41^\circ 15' 35''$.

Solution. For convenience in interpolation convert $35''$ into decimal parts of a minute. Then $41^\circ 15' 35'' = 41^\circ 15'.58$.

We find, from the table,

$$\begin{aligned}\log \sin 41^\circ 15' &= 9.81911, \\ \log \sin 41^\circ 16' &= 9.81926,\end{aligned}$$

whence we conclude

$$\log \sin 41^\circ 15'.58 = 9.81911 + .58 \text{ of 15 units of the 5th decimal place.}$$

Similarly

$$\log \tan 41^\circ 15'.58 = 9.94299 + .58 \text{ of 25 units of the 5th decimal place.}$$

$$\log \cot 41^\circ 15'.58 = 0.05701 - .58 \text{ of 25 units of the 5th decimal place.}$$

$$\log \cos 41^\circ 15'.58 = 9.87613 - .58 \text{ of 12 units of the 5th decimal place.}$$

We may use the marginal tables of proportional parts to complete the interpolation. Thus, the table headed 15 shows that .5 of 15 is 7.5 and .08 of 15 is 1.2, and consequently .58 of 15 is 8.7 or 9 units of the fifth decimal place. Therefore

$$\log \sin 4^\circ 15'.58 = 9.81920 - 10.$$

In the same way we find

$$\log \tan 41^\circ 15'.58 = 9.94314 - 10, \log \cot 41^\circ 15'.58 = 0.05686,$$

$$\log \cos 41^\circ 15'.58 = 9.87606 - 10.$$

EXAMPLE 2. Find the logarithms of the functions of $48^\circ 44'.42$.

Solution. This angle is the complement of that of example 1. Hence each of its functions is equal to the corresponding cofunction of $41^\circ 15'.58$, and the values obtained are the same as in example 1, with the name of each function changed to the corresponding cofunction.

Just as in the table of natural functions, these values, for angles greater than 45° , may be obtained directly from the table by reading the degrees of the angle at the *foot* of the page, the minutes in the right-hand column, and the name of the function at the foot of each of the four columns. We find, in this way,

$$\log \sin 48^\circ 44'.42 = 9.87606 - 10, \quad \log \cot 48^\circ 44'.42 = 9.94314 - 10,$$

$$\log \tan 48^\circ 44'.42 = 0.05686, \quad \log \cos 48^\circ 44'.42 = 9.81919 - 10.$$

EXAMPLE 3. Given $\log \tan A = 0.53219$. Find A .

Solution. The given logarithm does not appear anywhere in the column at the foot of which is printed the name L. Tan. But we do find in this column

$$\log \tan 73^\circ 38' = 0.53212,$$

$$\log \tan 73^\circ 39' = 0.53259.$$

Tabular difference for $1' = 0.00047$.

The given value of $\log \tan A$ is $\frac{5}{7}$, or $\frac{15}{100}$, of the way from the first toward the second of these tabular logarithms. Therefore

$$A = 73^\circ 38'.15.$$

TABLE III

The trigonometric functions of angles near 0° or 90° . If we wish to determine an angle for which $\log \cos A = 9.99998 - 10$, Table II cannot furnish an accurate result. We find, by referring to the table, that A may have any value between $0^\circ 29'$ and $0^\circ 36'$.

A small angle cannot be determined, with any degree of accuracy, from the value of its cosine.

In the same way, we see that *an angle very close to 90° cannot be determined accurately from the value of its sine.*

In most cases we shall be able to modify the formula, which we are using, in such a way as to avoid this difficulty. If, for instance, the angle A (known to be very small) is to be determined from the value of its cosine, we shall seek some other formula as a solution of the same problem by means of which the angle A can be determined from the value of its sine or tangent. The problem then reduces to that of finding a small angle when its sine or tangent is given. If we again refer to our table, we find that this problem also gives rise to a difficulty. The method of interpolation, which we ordinarily use, becomes both cumbersome and inexact in the case of such small angles, because the tabular differences are very large and change very rapidly from one place in the table to another.

In order to meet this difficulty, we have provided a separate table (Table III), giving the values of the logarithmic functions for every second of arc from $0^\circ 0'$ to $0^\circ 3'$ and from $89^\circ 57'$ to 90° , and for every ten seconds from 0° to 2° and from 88° to 90° .

TABLE IV

The auxiliary quantities S and T . Table IV provides a second method for meeting the difficulties which are encountered when dealing with angles near 0° or 90° . The method is based on the fact that the quotients

$$\frac{\sin \theta}{\theta} \text{ and } \frac{\tan \theta}{\theta}$$

change very slowly if θ is a small angle.

The formulæ given on the face of the table contain all the necessary directions, so that it will suffice to give some illustrative examples.

PROBLEM 1. Find the sine and tangent of $1^\circ 13'.21$ by using the auxiliaries S and T .

Solution. Since $\theta = 1^\circ 13'.21$, we have $\theta' = 73'.21$.

$$\begin{array}{rcl} \log \theta' = 1.86457 & & \log \theta' = 1.86457 \\ \hline S = 6.46369 - 10 & & T = 6.46379 - 10 \\ \hline \log \sin \theta = 8.32826 - 10 & & \log \tan \theta = 8.32836 - 10 \end{array}$$

PROBLEM 2. Given $\log \sin \theta = 8.24798 - 10$. Find θ .

Solution. We find from Table IV corresponding to $\log \sin \theta = 8.24798 - 10$, $S = 6.46370$. The formula $\log \theta' = \log \sin \theta - S'$ leads to the calculation

$$\begin{array}{rcl} \log \sin \theta = 8.24798 - 10 & & \\ \hline S = 6.46370 - 10 & & \\ \hline \log \theta' = 1.78428 & & \therefore \theta' = 60'.85 = 1^\circ 0'.85. \end{array}$$

TABLE V

Table V contains the four-place values of the sine, cosine, tangent, and cotangent of all angles from 0° to 90° for every tenth of a degree. The following examples will serve to explain its arrangement and use.

PROBLEM 1. Find the functions of $35^\circ.2$.

Solution. In the left-hand column find $35^\circ.2$. The four numbers which are printed in the horizontal row to the *right* of $35^\circ.2$ are, *from left to right*, the sine, tangent, cotangent, and cosine of $35^\circ.2$, as indicated by the name printed at the *head* of each of these columns. Therefore

$$\begin{aligned} \sin 35^\circ.2 &= 0.5764, \tan 35^\circ.2 = 0.7054, \cot 35^\circ.2 = 1.4176, \\ \cos 35^\circ.2 &= 0.8171. \end{aligned}$$

PROBLEM 2. Find the functions of $54^\circ.8$.

Solution. In the right-hand column find $54^\circ.8$. The four numbers which are printed in the horizontal row to the *left* of $54^\circ.8$ are, *from right*

to left, the sine, tangent, cotangent, and cosine of $54^\circ.8$, as indicated by the name printed at the *foot* of each of these columns. Therefore

$$\begin{aligned}\sin 54^\circ.8 &= 0.8171, \tan 54^\circ.8 = 1.4176, \cot 54^\circ.8 = 0.7054, \\ \cos 54^\circ.8 &= 0.5764.\end{aligned}$$

Thus every number of the table does double duty. For example, 0.5764 is both the sine of $35^\circ.2$ and the cosine of $54^\circ.8$, as it should be.

Angles less than 45° are given in the left-hand column of the table, and the names of the corresponding functions are found at the *top* of the page. Angles greater than 45° are given in the right-hand column with the names of the functions at the *bottom* of the page.

The table gives the values of the functions only for every tenth of a degree. If the given angle contains fractional parts of this unit, its functions cannot be read directly from the table. In such cases we make use of the process of **interpolation**, the nature of which will become apparent from the following examples.

PROBLEM 3. Find the sine of $35^\circ.17$.

Solution. This angle lies between $35^\circ.1$ and $35^\circ.2$. More precisely, it lies $\frac{7}{10}$ of the way from the former toward the latter. We conclude that its sine will be $\frac{7}{10}$ of the way from

$$\sin 35^\circ.1 = 0.5750 \text{ toward } \sin 35^\circ.2 = 0.5764.$$

But the difference d between these last two numbers is 0.0014, seven tenths of which is equal to 0.0010 (reduced to four decimal places). Therefore

$$\sin 35^\circ.17 = 0.5750 + 0.0010 = 0.5760.$$

PROBLEM 4. Find the cotangent of $35^\circ.17$.

Solution. From the table we find

$$\begin{array}{rcl}\cot 35^\circ.1 & = & 1.4229 \\ \cot 35^\circ.2 & = & 1.4176 \\ \hline d = \cot 35^\circ.2 - \cot 35^\circ.1 & = & -0.0053 \end{array} \quad (\text{tabular difference})$$

We must add $\frac{7}{10}$ of d to $\cot 35^\circ.1$. But $\frac{7}{10} d = -0.0037$.

Therefore

$$\cot 35^\circ.17 = 1.4192.$$

We observe that in problem 3 the correction was positive, while in problem 4 it was negative.

If we always interpolate from the smaller toward the larger angle, the correction will be positive in the case of sine and tangent, negative in the case of cosine and cotangent. For, the former two functions increase with the angle, while the latter two decrease.

There will never be any serious danger of giving the wrong sign to the correction, if we cultivate the habit of running through the numbers of the table near the place we are using, so as to see in which direction they are growing.

PROBLEM 5. The tangent of an unknown acute angle A is equal to 0.7046. Find the angle A .

Solution. We observe that the number 0.7046 does not occur in the tangent column. However, we find there the two numbers 0.7028 and 0.7054, between which 0.7046 lies. Thus we have

$$\begin{aligned}\tan 35^{\circ}.1 &= 0.7028, \\ \tan A &= 0.7046, \\ \tan 35^{\circ}.2 &= 0.7054.\end{aligned}$$

Between $\tan 35^{\circ}.1$ and $\tan A$, the difference is 0.0018.

Between $\tan 35^{\circ}.1$ and $\tan 35^{\circ}.2$, the difference is 0.0026.

Therefore, $\tan A$ is $\frac{1}{26}$ of the way from $\tan 35^{\circ}.1$ toward $\tan 35^{\circ}.2$, and consequently

$$A = 35^{\circ}.1 + \frac{1}{26} \text{ of one tenth of a degree,}$$

or

$$A = 35^{\circ}.1 + 0^{\circ}.07 = 35^{\circ}.17$$

reducing to the nearest hundredth of a degree.

PROBLEM 6. Find the acute angle A whose cosine is 0.5772.

Solution. We have, from the table and the data of the problem,

$$\begin{aligned}\cos 54^{\circ}.7 &= 0.5779, \\ \cos A &= 0.5772, \\ \cos 54^{\circ}.8 &= 0.5764,\end{aligned}$$

whence

$$\begin{aligned}\cos A - \cos 54^{\circ}.7 &= -0.0007, \\ \cos 54^{\circ}.8 - \cos 54^{\circ}.7 &= -0.0015.\end{aligned}$$

Therefore, $\cos A$ is $\frac{7}{15}$ of the way from $\cos 54^{\circ}.7$ toward $\cos 54^{\circ}.8$. Hence

$$A = 54^{\circ}.7 + \frac{7}{15} \text{ of one tenth of a degree}$$

or

$$A = 54^{\circ}.7 + 0^{\circ}.05 = 54^{\circ}.75.$$

TABLE VI

The arrangement and use of this table will be apparent from the following examples.

EXAMPLE 1. Find the squares of 0.324 and of 3.24.

Solution. In the left-hand column of Table VI we find 0.32. In the same horizontal row with this number, and in the column headed 4, we find 0.1050. Therefore

$$(0.324)^2 = 0.1050, \quad (3.24)^2 = 10.50.$$

EXAMPLE 2. Find the squares of 0.3243, of 3.243, and of 32.43.

Solution. From the table we find

$$(0.324)^2 = 0.1050, \quad (0.325)^2 = 0.1056.$$

The difference between the two squares is 0.0006. The number 0.3243 is three tenths of the way from 0.324 toward 0.325. Therefore, its square will be three tenths of the way from 0.1050 toward 0.1056. That is

$$(0.3243)^2 = 0.1050 + \frac{3}{10} \text{ of } 0.0006 = 0.1050 + 0.0002 = 0.1052, \text{ and}$$

$$(3.243)^2 = 10.52, \quad (32.43)^2 = 1052.$$

EXAMPLE 3. Find the square root of 0.5520.

Solution. We find from the table that this number is the square of 0.743. Therefore

$$\sqrt{0.5520} = 0.743.$$

EXAMPLE 4. Find the square root of 0.5525.

Solution. The table gives

$$\sqrt{0.5520} = 0.743, \quad \sqrt{0.5535} = 0.744.$$

Therefore, by interpolation

$$\sqrt{0.5525} = 0.743 + \frac{5}{15} \text{ of } 0.001 = 0.743 + 0.0003 = 0.7433.$$

In using Table VI the following remarks are important.

1. *To a change of one place in the position of the decimal point in a number N , corresponds a change of two places of the decimal point in N^2 .*

2. *To a change of two places in the position of the decimal point in N , corresponds a change of one place in \sqrt{N} .*

TABLE VII

Table VII enables us to save time in converting an angle which is expressed in minutes and seconds to decimal parts of a degree and *vice versa*. Its arrangement and use is so obvious as to require no explanation.

TABLE VIII

Table VIII is merely a collection of some frequently occurring numbers and their logarithms.

TABLES IX, X, AND XI

These tables are three-place tables, arranged and used in accordance with the same principles that have been explained in connection with the larger five- and four-place tables. They should be used whenever the accuracy required for the result is properly expressed by numbers of two or three digits.

TABLES

TABLE I

FIVE-PLACE LOGARITHMS OF NUMBERS

N	0	1	2	3	4	5	6	7	8	9	P P			
100	00 000	043	087	130	173	217	260	303	346	389				
101	432	475	518	561	604	647	689	732	775	817	44 43 42			
102	860	903	945	988	*030	*072	*115	*157	*199	*242	1	4.4	4.3	4.2
103	01 284	326	368	410	452	494	536	578	620	662	2	8.8	8.6	8.4
104	703	745	787	828	870	912	953	995	*036	*078	3	13.2	12.9	12.6
105	02 119	160	202	243	284	325	366	407	449	490	4	17.6	17.2	16.8
106	531	572	612	653	694	735	776	816	857	898	5	22.0	21.5	21.0
107	938	979	*019	*060	*100	*141	*181	*222	*262	*302	6	26.4	25.8	25.2
108	03 342	383	423	463	503	543	583	623	663	703	7	30.8	30.1	29.4
109	743	782	822	862	902	941	981	*021	*060	*100	8	35.2	34.4	33.6
110	04 139	179	218	258	297	336	376	415	454	493	9	39.6	38.7	37.8
111	532	571	610	650	689	727	766	805	844	883	41 40 39			
112	922	961	999	*038	*077	*115	*154	*192	*231	*269	1	4.1	4.0	3.9
113	05 308	346	385	423	461	500	538	576	614	652	2	8.2	8.0	7.8
114	690	729	767	805	843	881	918	956	994	*032	3	12.3	12.0	11.7
115	06 070	108	145	183	221	258	296	333	371	408	4	16.4	16.0	15.6
116	446	483	521	558	595	633	670	707	744	781	5	20.5	20.0	19.5
117	819	856	893	930	967	*004	*041	*078	*115	*151	7	28.7	28.0	27.3
118	07 188	225	262	298	335	372	408	445	482	518	8	32.8	32.0	31.2
119	555	591	628	664	700	737	773	809	846	882	9	36.9	36.0	35.1
120	918	954	990	*027	*063	*099	*135	*171	*207	*243				
121	08 279	314	350	386	422	458	493	529	565	600	38 37 36			
122	636	672	707	743	778	814	849	884	920	955	1	3.8	3.7	3.6
123	991	*026	*061	*096	*132	*167	*202	*237	*272	*307	2	7.6	7.4	7.2
124	09 342	377	412	447	482	517	552	587	621	656	3	11.4	11.1	10.8
125	691	726	760	795	830	864	899	934	968	*003	4	15.2	14.8	14.4
126	10 037	072	106	140	175	209	243	278	312	346	5	19.0	18.5	18.0
127	380	415	449	483	517	551	585	619	653	687	7	26.6	25.9	25.2
128	721	755	789	823	857	890	924	958	992	*025	8	30.4	29.6	28.8
129	11 059	093	126	160	193	227	261	294	327	361	9	34.2	33.3	32.4
130	394	428	461	494	528	561	594	628	661	694	35 34 33			
131	727	760	793	826	860	893	926	959	992	*024				
132	12 057	090	123	156	189	222	254	287	320	352	1	3.5	3.4	3.3
133	385	418	450	483	516	548	581	613	646	678	2	7.0	6.8	6.6
134	710	743	775	808	840	872	905	937	969	*001	3	10.5	10.2	9.9
135	13 033	066	098	130	162	194	226	258	290	322	4	14.0	13.6	13.2
136	354	386	418	450	481	513	545	577	609	640	5	17.5	17.0	16.5
137	672	704	735	767	799	830	862	893	925	956	7	24.5	23.8	23.1
138	988	*019	*051	*082	*114	*145	*176	*208	*239	*270	8	28.0	27.2	26.4
139	14 301	333	364	395	426	457	489	520	551	582	9	31.5	30.6	29.7
140	613	644	675	706	737	768	799	829	860	891	32 31 30			
141	922	953	983	*014	*045	*076	*106	*137	*168	*198				
142	15 229	259	290	320	351	381	412	442	473	503	1	3.2	3.1	3.0
143	534	564	594	625	655	685	715	746	776	806	2	6.4	6.2	6.0
144	836	866	897	927	957	987	*017	*047	*077	*107	3	9.6	9.3	9.0
145	16 137	167	197	227	256	286	316	346	376	406	5	16.0	15.5	15.0
146	435	465	495	524	554	584	613	643	673	702	6	19.2	18.6	18.0
147	732	761	791	820	850	879	909	938	967	997	7	22.4	21.7	21.0
148	17 026	056	085	114	143	173	202	231	260	289	8	25.6	24.8	24.0
149	319	348	377	406	435	464	493	522	551	580	9	28.8	27.9	27.0
150	609	638	667	696	725	754	782	811	840	869				
N	0	1	2	3	4	5	6	7	8	9	P P			

N	0	1	2	3	4	5	6	7	8	9	P P
150	17 609	638	667	696	725	754	782	811	840	869	
151	898	926	955	984	*013	*041	*070	*099	*127	*156	29 28
152	18 184	213	241	270	298	327	355	384	412	441	1 2.9 2.8
153	469	498	526	554	583	611	639	667	696	724	2 5.8 5.6
154	752	780	808	837	865	893	921	949	977	*005	3 8.7 8.4
155	19 033	061	089	117	145	173	201	229	257	285	4 11.6 11.2
156	312	340	368	396	424	451	479	507	535	562	5 14.5 14.0
157	590	618	645	673	700	728	756	783	811	838	6 17.4 16.8
158	866	893	921	948	976	*003	*030	*058	*085	*112	7 20.3 19.6
159	20 140	167	194	222	249	276	303	330	358	385	8 23.2 22.4
160	412	439	466	493	520	548	575	602	629	656	9 26.1 25.2
161	683	710	737	763	790	817	844	871	898	925	27 26
162	952	978	*005	*032	*059	*085	*112	*139	*165	*192	1 2.7 2.6
163	21 219	245	272	299	325	352	378	405	431	458	2 5.4 5.2
164	484	511	537	564	590	617	643	669	696	722	3 8.1 7.8
165	748	775	801	827	854	880	906	932	958	985	4 10.8 10.4
166	22 011	037	063	089	115	141	167	194	220	246	5 13.5 13.0
167	272	298	324	350	376	401	427	453	479	505	6 16.2 15.6
168	531	557	583	608	634	660	686	712	737	763	7 18.9 18.2
169	789	814	840	866	891	917	943	968	994	*019	8 21.6 20.8
170	23 045	070	096	121	147	172	198	223	249	274	9 24.3 23.4
171	300	325	350	376	401	426	452	477	502	528	25
172	553	578	603	629	654	679	704	729	754	779	1 2.5
173	805	830	855	880	905	930	955	980	*005	*030	2 5.0
174	24 055	080	105	130	155	180	204	229	254	279	3 7.5
175	304	329	353	378	403	428	452	477	502	527	4 10.0
176	551	576	601	625	651	674	699	724	748	773	5 12.5
177	797	822	846	871	895	920	944	969	993	*018	6 15.0
178	25 042	066	091	115	139	164	188	212	237	261	7 17.5
179	285	310	334	358	382	406	431	455	479	503	8 20.0
180	527	551	575	600	624	648	672	696	720	744	9 22.5
181	768	792	816	840	864	888	912	935	959	983	24 23
182	26 007	031	055	079	102	126	150	174	198	221	1 2.4 2.3
183	245	269	293	316	340	364	387	411	435	458	2 4.8 4.6
184	482	505	529	553	576	600	623	647	670	694	3 7.2 6.9
185	717	741	764	788	811	834	858	881	905	928	4 9.6 9.2
186	951	975	998	*021	*045	*068	*091	*114	*138	*161	5 12.0 11.5
187	27 184	207	231	254	277	300	323	346	370	393	6 14.4 13.8
188	416	439	462	485	508	531	554	577	600	623	7 16.8 16.1
189	646	669	692	715	738	761	784	807	830	852	8 19.2 18.4
190	875	898	921	944	967	989	*012	*035	*058	*081	9 21.6 20.7
191	28 103	126	149	171	194	217	240	262	285	307	22 21
192	330	353	375	398	421	443	466	488	511	533	1 2.2 2.1
193	556	578	601	623	646	668	691	713	735	758	2 4.4 4.2
194	780	803	825	847	870	892	914	937	959	981	3 6.6 6.3
195	29 003	026	048	070	092	115	137	159	181	203	4 8.8 8.4
196	226	248	270	292	314	336	358	380	403	425	5 11.0 10.5
197	447	469	491	513	535	557	579	601	623	645	6 13.2 12.0
198	667	688	710	732	754	776	798	820	842	863	7 15.4 14.7
199	885	907	929	951	973	994	*016	*038	*060	*081	8 17.6 16.8
200	30 103	125	146	168	190	211	233	255	276	298	9 19.8 18.9
N	0	1	2	3	4	5	6	7	8	9	P P

N	0	1	2	3	4	5	6	7	8	9	P P
200	30 103	125	146	168	190	211	233	255	276	298	
201	320	341	363	384	406	428	449	471	492	514	22 21
202	535	557	578	600	621	643	664	685	707	728	
203	750	771	792	814	835	856	878	899	920	942	I 2.2 2.1
204	963	984	*006	*027	*048	*069	*091	*112	*133	*154	2 4.4 4.2
205	31 175	197	218	239	260	281	302	323	345	366	3 6.6 6.3
206	387	408	429	450	471	492	513	534	555	576	4 8.8 8.4
207	597	618	639	660	681	702	723	744	765	785	5 11.0 10.5
208	806	827	848	869	890	911	931	952	973	994	6 13.2 12.6
209	32 015	035	056	077	098	118	139	160	181	201	7 15.4 14.7
210	222	243	263	284	305	325	346	366	387	408	8 17.6 16.8
211	428	449	469	490	510	531	552	572	593	613	9 19.8 18.9
212	634	654	675	695	715	736	756	777	797	818	
213	838	858	879	899	919	940	960	980	*001	*021	I 2.0
214	33 041	062	082	102	122	143	163	183	203	224	2 4.0
215	244	264	284	304	325	345	365	385	405	425	3 6.0
216	445	465	486	506	526	546	566	586	606	626	4 8.0
217	646	666	686	706	726	746	766	786	806	826	5 10.0
218	846	866	885	905	925	945	965	985	*005	*025	6 12.0
219	34 044	064	084	104	124	143	163	183	203	223	7 14.0
220	242	262	282	301	321	341	361	380	400	420	8 16.0
221	439	459	479	498	518	537	557	577	596	616	9 18.0
222	635	655	674	694	713	733	753	772	792	811	
223	830	850	869	889	908	928	947	967	986	*005	I 1.0
224	35 025	044	064	083	102	122	141	160	180	199	2 3.8
225	218	238	257	276	295	315	334	353	372	392	3 5.7
226	411	430	449	468	488	507	526	545	564	583	4 7.6
227	603	622	641	660	679	698	717	736	755	774	5 9.5
228	793	813	832	851	870	889	908	927	946	965	6 11.4
229	984	*003	*021	*040	*059	*078	*097	*116	*135	*154	7 13.3
230	36 173	192	211	229	248	267	286	305	324	342	8 15.2
231	361	380	399	418	436	455	474	493	511	530	9 17.1
232	549	568	586	605	624	642	661	680	698	717	
233	736	754	773	791	810	829	847	866	884	903	I 1.8
234	922	940	959	977	996	*014	*033	*051	*070	*088	2 3.6
235	37 107	125	144	162	181	199	218	236	254	273	3 5.4
236	291	310	328	346	365	383	401	420	438	457	4 7.2
237	475	493	511	530	548	566	585	603	621	639	5 9.0
238	658	676	694	712	731	749	767	785	803	822	6 10.8
239	840	858	876	894	912	931	949	967	985	*003	7 12.6
240	38 021	039	057	075	093	112	130	148	166	184	8 14.4
241	202	220	238	256	274	292	310	328	346	364	9 16.2
242	382	399	417	435	453	471	489	507	525	543	
243	561	578	596	614	632	650	668	686	703	721	I 1.7
244	739	757	775	792	810	828	846	863	881	899	2 3.4
245	917	934	952	970	987	*005	*023	*041	*058	*076	3 5.1
246	39 094	111	129	146	164	182	199	217	235	252	4 6.8
247	270	287	305	322	340	358	375	393	410	428	5 8.5
248	445	463	480	498	515	533	550	568	585	602	6 10.2
249	620	637	655	672	690	707	724	742	759	777	7 11.9
250	794	811	829	846	863	881	898	915	933	950	8 13.6
N	0	1	2	3	4	5	6	7	8	9	P P

N	0	1	2	3	4	5	6	7	8	9	P P
250	39 794	811	829	846	863	881	898	915	933	950	
251	967	985	*002	*019	*037	*054	*071	*088	*106	*123	18
252	40 140	157	175	192	209	226	243	261	278	295	
253	312	329	346	364	381	398	415	432	449	466	
254	483	500	518	535	552	569	586	603	620	637	
255	654	671	688	705	722	739	756	773	790	807	
256	824	841	858	875	892	909	926	943	960	976	
257	993	*010	*027	*044	*061	*078	*095	*111	*128	*145	
258	41 162	179	196	212	229	246	263	280	296	313	
259	330	347	363	380	397	414	430	447	464	481	
260	497	514	531	547	564	581	597	614	631	647	
261	664	681	697	714	731	747	764	780	797	814	17
262	830	847	863	880	896	913	929	946	963	979	
263	996	*012	*029	*045	*062	*078	*095	*111	*127	*144	
264	42 160	177	193	210	226	243	259	275	292	308	
265	325	341	357	374	390	406	423	439	455	472	
266	488	504	521	537	553	570	586	602	619	635	
267	651	667	684	700	716	732	749	765	781	797	
268	813	830	846	862	878	894	911	927	943	959	
269	975	991	*008	*024	*040	*056	*072	*088	*104	*120	
270	43 136	152	169	185	201	217	233	249	265	281	
271	297	313	329	345	361	377	393	409	425	441	16
272	457	473	489	505	521	537	553	569	584	600	
273	616	632	648	664	680	696	712	727	743	759	
274	775	791	807	823	838	854	870	886	902	917	
275	933	949	965	981	996	*012	*028	*044	*059	*075	
276	44 091	107	122	138	154	170	185	201	217	232	
277	248	264	279	295	311	326	342	358	373	389	
278	404	420	436	451	467	483	498	514	529	545	
279	560	576	592	607	623	638	654	669	685	700	
280	716	731	747	762	778	793	809	824	840	855	
281	871	886	902	917	932	948	963	979	994	*010	15
282	45 025	040	056	071	086	102	117	133	148	163	
283	179	194	209	225	240	255	271	286	301	317	
284	332	347	362	378	393	408	423	439	454	469	
285	484	500	515	530	545	561	576	591	606	621	
286	637	652	667	682	697	712	728	743	758	773	
287	788	803	818	834	849	864	879	894	909	924	
288	939	954	969	984	*000	*015	*030	*045	*060	*075	
289	46 090	105	120	135	150	165	180	195	210	225	
290	240	255	270	285	300	315	330	345	359	374	
291	389	404	419	434	449	464	479	494	509	523	14
292	538	553	568	583	598	613	627	642	657	672	
293	687	702	716	731	746	761	776	790	805	820	
294	835	850	864	879	894	909	923	938	953	967	
295	982	997	*012	*026	*041	*056	*070	*085	*100	*114	
296	47 129	144	159	173	188	202	217	232	246	261	
297	276	290	305	319	334	349	363	378	392	407	
298	422	436	451	465	480	494	509	524	538	553	
299	567	582	596	611	625	640	654	669	683	698	
300	712	727	741	756	770	784	799	813	828	842	
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301	857	871	885	900	914	929	943	958	972	986	
302	48 001	015	029	044	058	073	087	101	116	130	
303	144	159	173	187	202	216	230	244	259	273	15
304	287	302	316	330	344	359	373	387	401	416	I 1.5
305	430	444	458	473	487	501	515	530	544	558	2 3.0
306	572	586	601	615	629	643	657	671	686	700	3 4.5
307	714	728	742	756	770	785	799	813	827	841	4 6.0
308	855	869	883	897	911	926	940	954	968	982	5 7.5
309	996	*010	*024	*038	*052	*066	*080	*094	*108	*122	6 9.0
310	49 136	150	164	178	192	206	220	234	248	262	7 10.5
311	276	290	304	318	332	346	360	374	388	402	8 12.0
312	415	429	443	457	471	485	499	513	527	541	9 13.5
313	554	568	582	596	610	624	638	651	665	679	-
314	693	707	721	734	748	762	776	790	803	817	
315	831	845	859	872	886	900	914	927	941	955	14
316	969	982	996	*010	*024	*037	*051	*065	*079	*092	
317	50 106	120	133	147	161	174	188	202	215	229	I 1.4
318	243	256	270	284	297	311	325	338	352	365	2 2.8
319	379	393	406	420	433	447	461	474	488	501	3 4.2
320	515	529	542	556	569	583	596	610	623	637	4 5.6
321	651	664	678	691	705	718	732	745	759	772	5 7.0
322	786	799	813	826	840	853	866	880	893	907	6 8.4
323	920	934	947	961	974	987	*001	*014	*028	*041	7 9.8
324	51 055	068	081	095	108	121	135	148	162	175	8 11.2
325	188	202	215	228	242	255	268	282	295	308	9 12.6
326	322	335	348	362	375	388	402	415	428	441	
327	455	468	481	495	508	521	534	548	561	574	
328	587	601	614	627	640	654	667	680	693	706	I 1.3
329	720	733	746	759	772	786	799	812	825	838	2 2.6
330	851	865	878	891	904	917	930	943	957	970	3 3.9
331	983	996	*009	*022	*035	*048	*061	*075	*088	*101	4 5.2
332	52 114	127	140	153	166	179	192	205	218	231	5 6.5
333	244	257	270	284	297	310	323	336	349	362	6 7.8
334	375	388	401	414	427	440	453	466	479	492	7 9.1
335	504	517	530	543	556	569	582	595	608	621	8 10.4
336	634	647	660	673	686	699	711	724	737	750	9 11.7
337	763	776	789	802	815	827	840	853	866	879	
338	892	905	917	930	943	956	969	982	994	*007	
339	53 020	033	046	058	071	084	097	110	122	135	12
340	148	161	173	186	199	212	224	237	250	263	I 1.2
341	275	288	301	314	326	339	352	364	377	390	2 2.4
342	403	415	428	441	453	466	479	491	504	517	3 3.6
343	529	542	555	567	580	593	605	618	631	643	4 4.8
344	656	668	681	694	706	719	732	744	757	769	5 6.0
345	782	794	807	820	832	845	857	870	882	895	6 7.2
346	908	920	933	945	958	970	983	995	*008	*020	7 8.4
347	54 033	045	058	070	083	095	108	120	133	145	8 9.6
348	158	170	183	195	208	220	233	245	258	270	9 10.8
349	283	295	307	320	332	345	357	370	382	394	
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352	654	667	679	691	704	716	728	741	753	765	
353	777	790	802	814	827	839	851	864	876	888	13
354	900	913	925	937	949	962	974	986	998	*011	I 1.3
355	55 023	035	047	060	072	084	096	108	121	133	2 2.6
356	145	157	169	182	194	206	218	230	242	255	3 3.9
357	267	279	291	303	315	328	340	352	364	376	4 5.2
358	388	400	413	425	437	449	461	473	485	497	5 6.5
359	509	522	534	546	558	570	582	594	606	618	6 7.8
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361	751	763	775	787	799	811	823	835	847	859	8 10.4
362	871	883	895	907	919	931	943	955	967	979	9 11.7
363	991	*003	*015	*027	*038	*050	*062	*074	*086	*098	
364	56 110	122	134	146	158	170	182	194	205	217	
365	229	241	253	265	277	289	301	312	324	336	12
366	348	360	372	384	396	407	419	431	443	455	
367	467	478	490	502	514	526	538	549	561	573	I 1.2
368	585	597	608	620	632	644	656	667	679	691	2 2.4
369	703	714	726	738	750	761	773	785	797	808	3 3.6
370	820	832	844	855	867	879	891	902	914	926	4 4.8
371	937	949	961	972	984	996	*008	*019	*031	*043	5 6.0
372	57 054	066	078	089	101	113	124	136	148	159	6 7.2
373	171	183	194	206	217	229	241	252	264	276	7 8.4
374	287	299	310	322	334	345	357	368	380	392	8 9.6
375	403	415	426	438	449	461	473	484	496	507	9 10.8
376	519	530	542	553	565	576	588	600	611	623	
377	634	646	657	669	680	692	703	715	726	738	11
378	749	761	772	784	795	807	818	830	841	852	I 1.1
379	864	875	887	898	910	921	933	944	955	967	2 2.2
380	978	990	*001	*013	*024	*035	*047	*058	*070	*081	3 3.3
381	58 092	104	115	127	138	149	161	172	184	195	4 4.4
382	206	218	229	240	252	263	274	286	297	309	5 5.5
383	320	331	343	354	365	377	388	399	410	422	6 6.6
384	433	444	456	467	478	490	501	512	524	535	7 7.7
385	546	557	569	580	591	602	614	625	636	647	8 8.8
386	659	670	681	692	704	715	726	737	749	760	9 9.9
387	771	782	794	805	816	827	838	850	861	872	
388	883	894	906	917	928	939	950	961	973	984	
389	995	*006	*017	*028	*040	*051	*062	*073	*084	*095	10
390	59 106	118	129	140	151	162	173	184	195	207	I 1.0
391	218	229	240	251	262	273	284	295	306	318	2 2.0
392	329	340	351	362	373	384	395	406	417	428	3 3.0
393	439	450	461	472	483	494	506	517	528	539	4 4.0
394	550	561	572	583	594	605	616	627	638	649	5 5.0
395	660	671	682	693	704	715	726	737	748	759	6 6.0
396	770	780	791	802	813	824	835	846	857	868	7 7.0
397	879	890	901	912	923	934	945	956	966	977	8 8.0
398	988	999	*010	*021	*032	*043	*054	*065	*076	*086	9 9.0
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402	423	433	444	455	466	477	487	498	509	520	
403	531	541	552	563	574	584	595	606	617	627	
404	638	649	660	670	681	692	703	713	724	735	
405	746	756	767	778	788	799	810	821	831	842	
406	853	863	874	885	895	906	917	927	938	949	
407	959	970	981	991	*002	*013	*023	*034	*045	*055	.11
408	61 066	077	087	098	109	119	130	140	151	162	1 1
409	172	183	194	204	215	225	236	247	257	268	2 2.2
410	278	289	300	310	321	331	342	352	363	374	3 3.3
411	384	395	405	416	426	437	448	458	469	479	4 4.4
412	490	500	511	521	532	542	553	563	574	584	5 5.5
413	595	606	616	627	637	648	658	669	679	690	6 6.6
414	700	711	721	731	742	752	763	773	784	794	7 7.7
415	805	815	826	836	847	857	868	878	888	899	8 8.8
416	909	920	930	941	951	962	972	982	993	*003	9 9.9
417	62 014	024	034	045	055	066	076	086	097	107	
418	118	128	138	149	159	170	180	190	201	211	
419	221	232	242	252	263	273	284	294	304	315	
420	325	335	346	356	366	377	387	397	408	418	10
421	428	439	449	459	469	480	490	500	511	521	
422	531	542	552	562	572	583	593	603	613	624	1 1.0
423	634	644	655	665	675	685	696	706	716	726	2 2.0
424	737	747	757	767	778	788	798	808	818	829	3 3.0
425	839	849	859	870	880	890	900	910	921	931	4 4.0
426	941	951	961	972	982	992	*002	*012	*022	*033	5 5.0
427	63 043	053	063	073	083	094	104	114	124	134	6 6.0
428	144	155	165	175	185	195	205	215	225	236	7 7.0
429	246	256	266	276	286	296	306	317	327	337	8 8.0
430	347	357	367	377	387	397	407	417	428	438	9
431	448	458	468	478	488	498	508	518	528	538	
432	548	558	568	579	589	599	609	619	629	639	
433	649	659	669	679	689	699	709	719	729	739	
434	749	759	769	779	789	799	809	819	829	839	
435	849	859	869	879	889	899	909	919	929	939	
436	949	959	969	979	988	998	*008	*018	*028	*038	
437	64 048	058	068	078	088	098	108	118	128	137	1 0.9
438	147	157	167	177	187	197	207	217	227	237	2 1.8
439	246	256	266	276	286	296	306	316	326	335	3 2.7
440	345	355	365	375	385	395	404	414	424	434	4 3.6
441	444	454	464	473	483	493	503	513	523	532	5 4.5
442	542	552	562	572	582	591	601	611	621	631	6 5.4
443	640	650	660	670	680	689	699	709	719	729	7 6.3
444	738	748	758	768	777	787	797	807	816	826	8 7.2
445	836	846	856	865	875	885	895	904	914	924	9 8.1
446	933	943	953	963	972	982	992	*002	*011	*021	
447	65 031	040	050	060	070	079	089	099	108	118	
448	128	137	147	157	167	176	186	196	205	215	
449	225	234	244	254	263	273	283	292	302	312	
450	321	331	341	350	360	369	379	389	398	408	
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451	418	427	437	447	456	466	475	485	495	504	
452	514	523	533	543	552	562	571	581	591	600	
453	610	619	629	639	648	658	667	677	686	696	
454	706	715	725	734	744	753	763	772	782	792	
455	801	811	820	830	839	849	858	868	877	887	
456	896	906	916	925	935	944	954	963	973	982	
457	992	*001	*011	*020	*030	*039	*049	*058	*068	*077	10
458	66 087	096	106	115	124	134	143	153	162	172	1
459	181	191	200	210	219	229	238	247	257	266	2
460	276	285	295	304	314	323	332	342	351	361	3
461	370	380	389	398	408	417	427	436	445	455	4
462	464	474	483	492	502	511	521	530	539	549	5
463	558	567	577	586	596	605	614	624	633	642	6
464	652	661	671	680	689	699	708	717	727	736	7
465	745	755	764	773	783	792	801	811	820	829	8
466	839	848	857	867	876	885	894	904	913	922	9
467	932	941	950	960	969	978	987	997	*006	*015	
468	67 025	034	043	052	062	071	080	089	099	108	
469	117	127	136	145	154	164	173	182	191	201	
470	210	219	228	237	247	256	265	274	284	293	9
471	302	311	321	330	339	348	357	367	376	385	
472	394	403	413	422	431	440	449	459	468	477	1
473	486	495	504	514	523	532	541	550	560	569	2
474	578	587	596	605	614	624	633	642	651	660	3
475	669	679	688	697	706	715	724	733	742	752	4
476	761	770	779	788	797	806	815	825	834	843	5
477	852	861	870	879	888	897	906	916	925	934	6
478	943	952	961	970	979	988	997	*006	*015	*024	7
479	68 034	043	052	061	070	079	088	097	106	115	8
480	124	133	142	151	160	169	178	187	196	205	
481	215	224	233	242	251	260	269	278	287	296	
482	305	314	323	332	341	350	359	368	377	386	
483	395	404	413	422	431	440	449	458	467	476	
484	485	494	502	511	520	529	538	547	556	565	
485	574	583	592	601	610	619	628	637	646	655	
486	664	673	681	690	699	708	717	726	735	744	8
487	753	762	771	780	789	797	806	815	824	833	1
488	842	851	860	869	878	886	895	904	913	922	2
489	931	940	949	958	966	975	984	993	*002	*011	3
490	69 020	028	037	046	055	064	073	082	090	099	4
491	108	117	126	135	144	152	161	170	179	188	5
492	197	205	214	223	232	241	249	258	267	276	6
493	285	294	302	311	320	329	338	346	355	364	7
494	373	381	390	399	408	417	425	434	443	452	
495	461	469	478	487	496	504	513	522	531	539	
496	548	557	566	574	583	592	601	609	618	627	
497	636	644	653	662	671	679	688	697	705	714	
498	723	732	740	749	758	767	775	784	793	801	
499	810	819	827	836	845	854	862	871	880	888	
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502	70 070	079	088	096	105	114	122	131	140	148	
503	157	165	174	183	191	200	209	217	226	234	
504	243	252	260	269	278	286	295	303	312	321	
505	329	338	346	355	364	372	381	389	398	406	
506	415	424	432	441	449	458	467	475	484	492	
507	501	509	518	526	535	544	552	561	569	578	9
508	586	595	603	612	621	629	638	646	655	663	1 0.0
509	672	680	689	697	706	714	723	731	740	749	2 1.8
510	757	766	774	783	791	800	808	817	825	834	3 2.7
511	842	851	859	868	876	885	893	902	910	919	4 3.6
512	927	935	944	952	961	969	978	986	995	*003	5 4.5
513	71 012	020	029	037	046	054	063	071	079	088	6 5.4
514	096	105	113	122	130	139	147	155	164	172	7 6.3
515	181	189	198	206	214	223	231	240	248	257	8 7.2
516	265	273	282	290	299	307	315	324	332	341	9 8.1
517	349	357	366	374	383	391	399	408	416	425	
518	433	441	450	458	466	475	483	492	500	508	
519	517	525	533	542	550	559	567	575	584	592	
520	600	609	617	625	634	642	650	659	667	675	8
521	684	692	700	709	717	725	734	742	750	759	1 0.8
522	767	775	784	792	800	809	817	825	834	842	2 1.6
523	850	858	867	875	883	892	900	908	917	925	3 2.4
524	933	941	950	958	966	975	983	991	999	*008	4 3.2
525	72 016	024	032	041	049	057	066	074	082	090	5 4.0
526	099	107	115	123	132	140	148	156	165	173	6 4.8
527	181	189	198	206	214	222	230	239	247	255	7 5.6
528	263	272	280	288	296	304	313	321	329	337	8 6.4
529	346	354	362	370	378	387	395	403	411	419	9 7.2
530	428	436	444	452	460	469	477	485	493	501	
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532	591	599	607	616	624	632	640	648	656	665	
533	673	681	689	697	705	713	722	730	738	746	
534	754	762	770	779	787	795	803	811	819	827	7
535	835	843	852	860	868	876	884	892	900	908	
536	916	925	933	941	949	957	965	973	981	989	
537	997	*006	*014	*022	*030	*038	*046	*054	*062	*070	1 0.7
538	73 078	086	094	102	111	119	127	135	143	151	2 1.4
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540	239	247	255	263	272	280	288	296	304	312	4 2.8
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542	400	408	416	424	432	440	448	456	464	472	6 4.2
543	480	488	496	504	512	520	528	536	544	552	7 4.9
544	560	568	576	584	592	600	608	616	624	632	8 5.6
545	640	648	656	664	672	679	687	695	703	711	9 6.3
546	719	727	735	743	751	759	767	775	783	791	
547	799	807	815	823	830	838	846	854	862	870	
548	878	886	894	902	910	918	926	933	941	949	
549	957	965	973	981	989	997	*005	*013	*020	*028	
550	74 036	044	052	060	068	076	084	092	099	107	
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552	194	202	210	218	225	233	241	249	257	265	
553	273	280	288	296	304	312	320	327	335	343	
554	351	359	367	374	382	390	398	406	414	421	
555	429	437	445	453	461	468	476	484	492	500	
556	507	515	523	531	539	547	554	562	570	578	
557	586	593	601	609	617	624	632	640	648	656	
558	663	671	679	687	695	702	710	718	726	733	
559	741	749	757	764	772	780	788	796	803	811	
560	819	827	834	842	850	858	865	873	881	889	
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566	282	289	297	305	312	320	328	335	343	351	
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572	740	747	755	762	770	778	785	793	800	808	
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593	305	313	320	327	335	342	349	357	364	371	
594	379	386	393	401	408	415	422	430	437	444	
595	452	459	466	474	481	488	495	503	510	517	
596	525	532	539	546	554	561	568	576	583	590	
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598	670	677	685	692	699	706	714	721	728	735	
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608	390	398	405	412	419	426	433	440	447	455	
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622	379	386	393	400	407	414	421	428	435	442	
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641	686	693	699	706	713	720	726	733	740	747	
642	754	760	767	774	781	787	794	801	808	814	
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653	491	498	505	511	518	525	531	538	544	551	
654	558	564	571	578	584	591	598	604	611	617	
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665	282	289	295	302	308	315	321	328	334	341	4
666	347	354	360	367	373	380	387	393	400	406	5
667	413	419	426	432	439	445	452	458	465	471	6
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676	995	*001	*008	*014	*020	*027	*033	*040	*046	*052	
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678	123	129	136	142	149	155	161	168	174	181	
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683	442	448	455	461	467	474	480	487	493	499	
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686	632	639	645	651	658	664	670	677	683	689	
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691	948	954	960	967	973	979	985	992	998	*004	
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693	073	080	086	092	098	105	111	117	123	130	
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705	819	825	831	837	844	850	856	862	868	874	
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716	491	497	503	509	516	522	528	534	540	546	
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721	794	800	806	812	818	824	830	836	842	848	1
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727	153	159	165	171	177	183	189	195	201	207	7
728	213	219	225	231	237	243	249	255	261	267	8
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732	451	457	463	469	475	481	487	493	499	504	
733	510	516	522	528	534	540	546	552	558	564	
734	570	576	581	587	593	599	605	611	617	623	
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736	688	694	700	705	711	717	723	729	735	741	5
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756	852	858	864	869	875	881	887	892	898	904	
757	910	915	921	927	933	938	944	950	955	961	
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767	480	485	491	497	502	508	513	519	525	530	2.4
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773	818	824	829	835	840	846	852	857	863	868	
774	874	880	885	891	897	902	908	913	919	925	
775	930	936	941	947	953	958	964	969	975	981	
776	986	992	997	*003	*009	*014	*020	*025	*031	*037	
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778	098	104	109	115	120	126	131	137	143	148	
779	154	159	165	170	176	182	187	193	198	204	
780	209	215	221	226	232	237	243	248	254	260	
781	265	271	276	282	287	293	298	304	310	315	5
782	321	326	332	337	343	348	354	360	365	371	
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787	597	603	609	614	620	625	631	636	642	647	7
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792	873	878	883	889	894	900	905	911	916	922	
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804	526	531	536	542	547	553	558	563	569	574		
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807	687	693	698	703	709	714	720	725	730	736		
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825	645	651	656	661	666	672	677	682	687	693		
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845	686	691	696	701	706	711	716	722	727	732		
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852	93 044	049	054	059	064	069	075	080	085	090	
853	095	100	105	110	115	120	125	131	136	141	
854	146	151	156	161	166	171	176	181	186	192	
855	197	202	207	212	217	222	227	232	237	242	
856	247	252	258	263	268	273	278	283	288	293	
857	298	303	308	313	318	323	328	334	339	344	6
858	349	354	359	364	369	374	379	384	389	394	
859	399	404	409	414	420	425	430	435	440	445	
860	450	455	460	465	470	475	480	485	490	495	
861	500	505	510	515	520	526	531	536	541	546	
862	551	556	561	566	571	576	581	586	591	596	
863	601	606	611	616	621	626	631	636	641	646	
864	651	656	661	666	671	676	682	687	692	697	
865	702	707	712	717	722	727	732	737	742	747	
866	752	757	762	767	772	777	782	787	792	797	
867	802	807	812	817	822	827	832	837	842	847	
868	852	857	862	867	872	877	882	887	892	897	
869	902	907	912	917	922	927	932	937	942	947	
870	952	957	962	967	972	977	982	987	992	997	
871	94 002	007	012	017	022	027	032	037	042	047	
872	052	057	062	067	072	077	082	086	091	096	
873	101	106	111	116	121	126	131	136	141	146	
874	151	156	161	166	171	176	181	186	191	196	
875	201	206	211	216	221	226	231	236	240	245	
876	250	255	260	265	270	275	280	285	290	295	
877	300	305	310	315	320	325	330	335	340	345	
878	349	354	359	364	369	374	379	384	389	394	
879	399	404	409	414	419	424	429	433	438	443	
880	448	453	458	463	468	473	478	483	488	493	
881	498	503	507	512	517	522	527	532	537	542	
882	547	552	557	562	567	571	576	581	586	591	
883	596	601	606	611	616	621	626	630	635	640	
884	645	650	655	660	665	670	675	680	685	689	
885	694	699	704	709	714	719	724	729	734	738	
886	743	748	753	758	763	768	773	778	783	787	
887	792	797	802	807	812	817	822	827	832	836	
888	841	846	851	856	861	866	871	876	880	885	
889	890	895	900	905	910	915	919	924	929	934	
890	939	944	949	954	959	963	968	973	978	983	
891	988	993	998	*002	*007	*012	*017	*022	*027	*032	
892	95 036	041	046	051	056	061	066	071	075	080	
893	085	090	095	100	105	109	114	119	124	129	
894	134	139	143	148	153	158	163	168	173	177	
895	182	187	192	197	202	207	211	216	221	226	
896	231	236	240	245	250	255	260	265	270	274	
897	279	284	289	294	299	303	308	313	318	323	
898	328	332	337	342	347	352	357	361	366	371	
899	376	381	386	390	395	400	405	410	415	419	
900	424	429	434	439	444	448	453	458	463	468	
N	0	1	2	3	4	5	6	7	8	9	P P

N	0	1	2	3	4	5	6	7	8	9	P P
900	95 424	429	434	439	444	448	453	458	463	468	
901	472	477	482	487	492	497	501	506	511	516	
902	521	525	530	535	540	545	550	554	559	564	
903	569	574	578	583	588	593	598	602	607	612	
904	617	622	626	631	636	641	646	650	655	660	
905	665	670	674	679	684	689	694	698	703	708	
906	713	718	722	727	732	737	742	746	751	756	
907	761	766	770	775	780	785	789	794	799	804	
908	809	813	818	823	828	832	837	842	847	852	
909	856	861	866	871	875	880	885	890	895	899	
910	904	909	914	918	923	928	933	938	942	947	
911	952	957	961	966	971	976	980	985	990	995	5
912	999	*004	*009	*014	*019	*023	*028	*033	*038	*042	
913	96 047	052	057	061	066	071	076	080	085	090	
914	095	099	104	109	114	118	123	128	133	137	
915	142	147	152	156	161	166	171	175	180	185	
916	190	194	199	204	209	213	218	223	227	232	
917	237	242	246	251	256	261	265	270	275	280	
918	284	289	294	298	303	308	313	317	322	327	
919	332	336	341	346	350	355	360	365	369	374	
920	379	384	388	393	398	402	407	412	417	421	
921	426	431	435	440	445	450	454	459	464	468	
922	473	478	483	487	492	497	501	506	511	515	
923	520	525	530	534	539	544	548	553	558	562	
924	567	572	577	581	586	591	595	600	605	609	
925	614	619	624	628	633	638	642	647	652	656	
926	661	666	670	675	680	685	689	694	699	703	
927	708	713	717	722	727	731	736	741	745	750	
928	755	759	764	769	774	778	783	788	792	797	
929	802	806	811	816	820	825	830	834	839	844	
930	848	453	858	862	867	872	876	881	886	890	
931	895	900	904	909	914	918	923	928	932	937	4
932	942	946	951	956	960	965	970	974	979	984	
933	988	993	997	*002	*007	*011	*016	*021	*025	*030	
934	97 035	039	044	049	053	058	063	067	072	077	
935	081	086	090	095	100	104	109	114	118	123	
936	128	132	137	142	146	151	155	160	165	169	
937	174	179	183	188	192	197	202	206	211	216	
938	220	225	230	234	239	243	248	253	257	262	
939	267	271	276	280	285	290	294	299	304	308	
940	313	317	322	327	331	336	340	345	350	354	
941	359	364	368	373	377	382	387	391	396	400	
942	405	410	414	419	424	428	433	437	442	447	
943	451	456	460	465	470	474	479	483	488	493	
944	497	502	506	511	516	520	525	529	534	539	
945	543	548	552	557	562	566	571	575	580	585	
946	589	594	598	603	607	612	617	621	626	630	
947	635	640	644	649	653	658	663	667	672	676	
948	681	685	690	695	699	704	708	713	717	722	
949	727	731	736	740	745	749	754	759	763	768	
950	772	777	782	786	791	795	800	804	809	813	
N	0	1	2	3	4	5	6	7	8	9	P P

N	0	1	2	3	4	5	6	7	8	9	P P
950	97 772	777	782	786	791	795	800	804	809	813	
951	818	823	827	832	836	841	845	850	855	859	
952	864	868	873	877	882	886	891	896	900	905	
953	909	914	918	923	928	932	937	941	946	950	
954	955	959	964	968	973	978	982	987	991	996	
955	98 000	005	009	014	019	023	028	032	037	041	
956	046	050	055	059	064	068	073	078	082	087	
957	091	096	100	105	109	114	118	123	127	132	
958	137	141	146	150	155	159	164	168	173	177	
959	182	186	191	195	200	204	209	214	218	223	
960	227	232	236	241	245	250	254	259	263	268	
961	272	277	281	286	290	295	299	304	308	313	5
962	318	322	327	331	336	340	345	349	354	358	
963	363	367	372	376	381	385	390	394	399	403	
964	408	412	417	421	426	430	435	439	444	448	
965	453	457	462	466	471	475	480	484	489	493	
966	498	502	507	511	516	520	525	529	534	538	
967	543	547	552	556	561	565	570	574	579	583	
968	588	592	597	601	605	610	614	619	623	628	
969	632	637	641	646	650	655	659	664	668	673	
970	677	682	686	691	695	700	704	709	713	717	
971	722	726	731	735	740	744	749	753	758	762	
972	767	771	776	780	784	789	793	798	802	807	
973	811	816	820	825	829	834	838	843	847	851	
974	856	860	865	869	874	878	883	887	892	896	
975	900	905	909	914	918	923	927	932	936	941	
976	945	949	954	958	963	967	972	976	981	985	
977	989	994	998	*003	*007	*012	*016	*021	*025	*029	
978	99 034	038	043	047	052	056	061	065	069	074	
979	078	083	087	092	096	100	105	109	114	118	
980	123	127	131	136	140	145	149	154	158	162	4
981	167	171	176	180	185	189	193	198	202	207	
982	211	216	220	224	229	233	238	242	247	251	
983	255	260	264	269	273	277	282	286	291	295	
984	300	304	308	313	317	322	326	330	335	339	
985	344	348	352	357	361	366	370	374	379	383	
986	388	392	396	401	405	410	414	419	423	427	
987	432	436	441	445	449	454	458	463	467	471	
988	476	480	484	489	493	498	502	506	511	515	
989	520	524	528	533	537	542	546	550	555	559	
990	564	568	572	577	581	585	590	594	599	603	
991	607	612	616	621	625	629	634	638	642	647	
992	651	656	660	664	669	673	677	682	686	691	
993	695	699	704	708	712	717	721	726	730	734	
994	739	743	747	752	756	760	765	769	774	778	
995	782	787	791	795	800	804	808	813	817	822	
996	826	830	835	839	843	848	852	856	861	865	
997	870	874	878	883	887	891	896	900	904	909	
998	913	917	922	926	930	935	939	944	948	952	
999	957	961	965	970	974	978	983	987	991	996	
1000	00 000	004	009	013	017	022	026	030	035	039	
N	0	1	2	3	4	5	6	7	8	9	P P

N	0	1	2	3	4	5	6	7	8	9
1000	000 0000	0434	0869	1303	1737	2171	2605	3039	3473	3907
1001	4341	4775	5208	5642	6076	6510	6943	7377	7810	8244
1002	8677	9111	9544	9977	*0411	*0844	*1277	*1710	*2143	*2576
1003	001 3009	3442	3875	4308	4741	5174	5607	6039	6472	6905
1004	7337	7770	8202	8635	9067	9499	9932	*0364	*0796	*1228
1005	002 1661	2093	2525	2957	3389	3821	4253	4685	5116	5548
1006	5980	6411	6843	7275	7706	8138	8569	9001	9432	9863
1007	003 0295	0726	1157	1588	2019	2451	2882	3313	3744	4174
1008	4665	5036	5467	5898	6328	6759	7190	7620	8051	8481
1009	8912	9342	9772	*0203	*0633	*1063	*1493	*1924	*2354	*2784
1010	004 3214	3644	4074	4504	4933	5363	5793	6223	6652	7082
1011	7512	7941	8371	8800	9229	9659	*0088	*0517	*0947	*1376
1012	005 1805	2234	2663	3092	3521	3950	4379	4808	5237	5666
1013	6094	6523	6952	7380	7809	8238	8666	9094	9523	9951
1014	006 0380	0808	1236	1664	2092	2521	2949	3377	3805	4233
1015	4660	5088	5516	5944	6372	6799	7227	7655	8082	8510
1016	8937	9365	9792	*0219	*0647	*1074	*1501	*1928	*2355	*2782
1017	007 3210	3637	4064	4490	4917	5344	5771	6198	6624	7051
1018	7478	7904	8331	8757	9184	9610	*0037	*0463	*0889	*1316
1019	008 1742	2168	2594	3020	3446	3872	4298	4724	5150	5576
1020	6002	6427	6853	7279	7704	8130	8556	8981	9407	9832
1021	009 0257	0683	1108	1533	1959	2384	2809	3234	3659	4084
1022	4509	4934	5359	5784	6208	6633	7058	7483	7907	8332
1023	8756	9181	9605	*0030	*0454	*0878	*1303	*1727	*2151	*2575
1024	010 3000	3424	3848	4272	4696	5120	5544	5967	6391	6815
1025	7239	7662	8086	8510	8933	9357	9780	*0204	*0627	*1050
1026	011 1474	1897	2320	2743	3166	3590	4013	4436	4859	5282
1027	5704	6127	6550	6973	7396	7818	8241	8664	9086	9509
1028	9931	*0354	*0776	*1198	*1621	*2043	*2465	*2887	*3310	*3732
1029	012 4154	4576	4998	5420	5842	6264	6685	7107	7529	7951
1030	8372	8794	9215	9637	*0059	*0480	*0901	*1323	*1744	*2165
1031	013 2587	3008	3429	3850	4271	4692	5113	5534	5955	6376
1032	6797	7218	7639	8059	8480	8901	9321	9742	*0162	*0583
1033	014 1003	1424	1844	2264	2685	3105	3525	3945	4365	4785
1034	5205	5625	6045	6465	6885	7305	7725	8144	8564	8984
1035	9403	9823	*0243	*0662	*1082	*1501	*1920	*2340	*2759	*3178
1036	015 3598	4017	4436	4855	5274	5693	6112	6531	6950	7369
1037	7788	8206	8625	9044	9462	9881	*0300	*0718	*1137	*1555
1038	016 1974	2392	2810	3229	3647	4065	4483	4901	5319	5737
1039	6155	6573	6991	7409	7827	8245	8663	9080	9498	9916
1040	017 0333	0751	1168	1586	2003	2421	2838	3256	3673	4090
1041	4507	4924	5342	5759	6176	6593	7010	7427	7844	8260
1042	8677	9094	9511	9927	*0344	*0761	*1177	*1594	*2010	*2427
1043	018 2843	3259	3676	4092	4508	4925	5341	5757	6173	6589
1044	7005	7421	7837	8253	8669	9084	9500	9916	*0332	*0747
1045	019 1163	1578	1994	2410	2825	3240	3656	4071	4486	4902
1046	5317	5732	6147	6562	6977	7392	7807	8222	8637	9052
1047	9467	9882	*0296	*0711	*1126	*1540	*1955	*2369	*2784	*3198
1048	020 3613	4027	4442	4856	5270	5684	6099	6513	6927	7341
1049	7755	8169	8583	8997	9411	9824	*0238	*0652	*1066	*1479
1050	021 1893	2307	2720	3134	3547	3961	4374	4787	5201	5614
N	0	1	2	3	4	5	6	7	8	9

N	0	1	2	3	4	5	6	7	8	9
1050	021 1893	2307	2720	3134	3547	3961	4374	4787	5201	5614
1051	6027	6440	6854	7267	7680	8093	8506	8919	9332	9745
1052	022 0157	0570	0983	1396	1808	2221	2634	3046	3459	3871
1053	4284	4696	5109	5521	5933	6345	6758	7170	7582	7994
1054	8406	8818	9230	9642	*0054	*0466	*0878	*1289	*1701	*2113
1055	023 2525	2936	3348	3759	4171	4582	4994	5405	5817	6228
1056	6639	7050	7462	7873	8284	8695	9106	9517	9928	*0339
1057	024 0750	1161	1572	1982	2393	2804	3214	3625	4036	4446
1058	4857	5267	5678	6088	6498	6909	7319	7729	8139	8549
1059	8960	9370	9780	*0190	*0600	*1010	*1419	*1829	*2239	*2649
1060	025 3059	3468	3878	4288	4697	5107	5516	5926	6335	6744
1061	7154	7563	7972	8382	8791	9200	9609	*0018	*0427	*0836
1062	026 1245	1654	2063	2472	2881	3289	3698	4107	4515	4924
1063	5333	5741	6150	6558	6967	7375	7783	8192	8600	9008
1064	9416	9824	*0233	*0641	*1049	*1457	*1865	*2273	*2680	*3088
1065	027 3496	3904	4312	4719	5127	5535	5942	6350	6757	7165
1066	7572	7979	8387	8794	9201	9609	*0016	*0423	*0830	*1237
1067	028 1644	2051	2458	2865	3272	3679	4086	4492	4899	5306
1068	5713	6119	6526	6932	7339	7745	8152	8558	8964	9371
1069	9777	*0183	*0590	*0996	*1402	*1808	*2214	*2620	*3026	*3432
1070	029 3838	4244	4649	5055	5461	5867	6272	6678	7084	7489
1071	7895	8300	8706	9111	9516	9922	*0327	*0732	*1138	*1543
1072	030 1948	2353	2758	3163	3568	3973	4378	4783	5188	5592
1073	5997	6402	6807	7211	7616	8020	8425	8830	9234	9638
1074	031 0043	0447	0851	1256	1660	2064	2468	2872	3277	3681
1075	4085	4489	4893	5296	5700	6104	6508	6912	7315	7719
1076	8123	8526	8930	9333	9737	*0140	*0544	*0947	*1350	*1754
1077	032 2157	2560	2963	3367	3770	4173	4576	4979	5382	5785
1078	6188	6590	6993	7396	7799	8201	8604	9007	9409	9812
1079	033 0214	0617	1019	1422	1824	2226	2629	3031	3433	3835
1080	4238	4640	5042	5444	5846	6248	6650	7052	7453	7855
1081	8257	8659	9060	9462	9864	*0265	*0667	*1068	*1470	*1871
1082	034 2273	2674	3075	3477	3878	4279	4680	5081	5482	5884
1083	6285	6686	7087	7487	7888	8289	8690	9091	9491	9892
1084	035 0293	0693	1094	1495	1895	2296	2696	3096	3497	3897
1085	4297	4698	5098	5498	5898	6298	6698	7098	7498	7898
1086	8298	8698	9098	9498	9898	*0297	*0697	*1097	*1496	*1896
1087	036 2295	2695	3094	3494	3893	4293	4692	5091	5491	5890
1088	6289	6688	7087	7486	7885	8284	8683	9082	9481	9880
1089	037 0279	0678	1076	1475	1874	2272	2671	3070	3468	3867
1090	4265	4663	5062	5460	5858	6257	6655	7053	7451	7849
1091	8248	8646	9044	9442	9839	*0237	*0635	*1033	*1431	*1829
1092	038 2226	2624	3022	3419	3817	4214	4612	5009	5407	5804
1093	6202	6599	6996	7393	7791	8188	8585	8982	9379	9776
1094	039 0173	0570	0967	1364	1761	2158	2554	2951	3348	3745
1095	4141	4538	4934	5331	5727	6124	6520	6917	7313	7709
1096	8106	8502	8898	9294	9690	*0086	*0482	*0878	*1274	*1670
1097	040 2066	2462	2858	3254	3650	4045	4441	4837	5232	5628
1098	6023	6419	6814	7210	7605	8001	8396	8791	9187	9582
1099	9977	*0372	*0767	*1162	*1557	*1952	*2347	*2742	*3137	*3532
1100	041 3927	4322	4716	5111	5506	5900	6295	6690	7084	7479

TABLE II
FIVE-PLACE LOGARITHMS
OF THE
TRIGONOMETRIC FUNCTIONS

FOR EVERY MINUTE OF ARC FROM 0° TO 90°

I	L Sin	d	L Tan	c d	L Cot	L Cos	
0	—	—	—	—	—	0.00 000	60
1	6.46 373	30103	6.46 373	30103	3.53 627	0.00 000	59
2	6.76 476	17609	6.76 476	17609	3.23 524	0.00 000	58
3	6.94 085	12494	6.94 085	12494	3.05 915	0.00 000	57
4	7.06 579	9691	7.06 579	9691	2.93 421	0.00 000	56
5	7.16 270	7918	7.16 270	7918	2.83 730	0.00 000	55
6	7.24 188	6694	7.24 188	6694	2.75 812	0.00 000	54
7	7.30 882	5800	7.30 882	5800	2.69 118	0.00 000	53
8	7.36 682	5115	7.36 682	5115	2.63 318	0.00 000	52
9	7.41 797	4576	7.41 797	4576	2.58 203	0.00 000	51
10	7.46 373	4139	7.46 373	4139	2.53 627	0.00 000	50
11	7.50 512	3779	7.50 512	3779	2.49 488	0.00 000	49
12	7.54 291	3476	7.54 291	3476	2.45 709	0.00 000	48
13	7.57 767	3218	7.57 767	3219	2.42 233	0.00 000	47
14	7.60 985	2997	7.60 986	2996	2.39 014	0.00 000	46
15	7.63 982	2802	7.63 982	2803	2.36 018	0.00 000	45
16	7.66 784	2633	7.66 785	2633	2.33 215	0.00 000	44
17	7.69 417	2483	7.69 418	2482	2.30 582	0.99 999	43
18	7.71 900	2348	7.71 900	2348	2.28 100	0.99 999	42
19	7.74 248	2227	7.74 248	2228	2.25 752	0.99 999	41
20	7.76 475	2119	7.76 476	2119	2.23 524	0.99 999	40
21	7.78 594	2021	7.78 595	2020	2.21 405	0.99 999	39
22	7.80 615	1930	7.80 615	1931	2.19 385	0.99 999	38
23	7.82 545	1848	7.82 546	1848	2.17 454	0.99 999	37
24	7.84 393	1773	7.84 394	1773	2.15 606	0.99 999	36
25	7.86 166	1704	7.86 167	1704	2.13 833	0.99 999	35
26	7.87 870	1639	7.87 871	1639	2.12 129	0.99 999	34
27	7.89 509	1579	7.89 510	1579	2.10 490	0.99 999	33
28	7.91 088	1524	7.91 089	1524	2.08 911	0.99 999	32
29	7.92 612	1472	7.92 613	1473	2.07 387	0.99 998	31
30	7.94 084	1424	7.94 086	1424	2.05 914	0.99 998	30
31	7.95 508	1379	7.95 510	1379	2.04 490	0.99 998	29
32	7.96 887	1336	7.96 889	1336	2.03 111	0.99 998	28
33	7.98 223	1297	7.98 225	1297	2.01 775	0.99 998	27
34	7.99 520	1250	7.99 522	1250	2.00 478	0.99 998	26
35	8.00 779	1223	8.00 781	1223	1.99 219	0.99 998	25
36	8.02 002	1190	8.02 004	1190	1.97 996	0.99 998	24
37	8.03 192	1158	8.03 194	1159	1.96 806	0.99 997	23
38	8.04 350	1128	8.04 353	1128	1.95 647	0.99 997	22
39	8.05 478	1100	8.05 481	1100	1.94 519	0.99 997	21
40	8.06 578	1072	8.06 581	1072	1.93 419	0.99 997	20
41	8.07 650	1046	8.07 653	1047	1.92 347	0.99 997	19
42	8.08 696	1022	8.08 700	1022	1.91 300	0.99 997	18
43	8.09 718	999	8.09 722	998	1.90 278	0.99 997	17
44	8.10 717	976	8.10 720	976	1.89 280	0.99 996	16
45	8.11 693	954	8.11 696	955	1.88 304	0.99 996	15
46	8.12 647	934	8.12 651	934	1.87 349	0.99 996	14
47	8.13 581	914	8.13 585	915	1.86 415	0.99 996	13
48	8.14 495	896	8.14 500	895	1.85 500	0.99 996	12
49	8.15 391	877	8.15 395	878	1.84 605	0.99 996	11
50	8.16 268	860	8.16 273	860	1.83 727	0.99 995	10
51	8.17 128	843	8.17 133	843	1.82 867	0.99 995	9
52	8.17 971	827	8.17 976	828	1.82 024	0.99 995	8
53	8.18 798	812	8.18 804	812	1.81 196	0.99 995	7
54	8.19 610	797	8.19 616	797	1.80 384	0.99 995	6
55	8.20 407	782	8.20 413	782	1.79 587	0.99 994	5
56	8.21 189	769	8.21 195	769	1.78 805	0.99 994	4
57	8.21 958	755	8.21 964	756	1.78 036	0.99 994	3
58	8.22 713	743	8.22 720	742	1.77 280	0.99 994	2
59	8.23 456	730	8.23 462	730	1.76 538	0.99 994	1
60	8.24 186	—	8.24 192	—	1.75 808	0.99 993	0
	L Cos	d	L Cot	c d	L Tan	L Sin	/

/	L Sin	d	L Tan	c d	L Cot	L Cos	
0	8.24 186		8.24 192		1.75 808	9.99 993	60
1	8.24 903	717	8.24 910	718	1.75 090	9.99 993	59
2	8.25 609	706	8.25 616	706	1.74 384	9.99 993	58
3	8.26 304	695	8.26 312	696	1.73 688	9.99 993	57
4	8.26 988	684	8.26 996	684	1.73 004	9.99 992	56
5	8.27 661	673	8.27 669	673	1.72 331	9.99 992	55
6	8.28 324	663	8.28 332	663	1.71 668	9.99 992	54
7	8.28 977	653	8.28 986	654	1.71 014	9.99 992	53
8	8.29 621	644	8.29 629	643	1.70 371	9.99 992	52
9	8.30 255	634	8.30 263	634	1.69 737	9.99 991	51
10	8.30 879	624	8.30 888	625	1.69 112	9.99 991	50
11	8.31 495	616	8.31 505	617	1.68 495	9.99 991	49
12	8.32 103	608	8.32 112	607	1.67 888	9.99 990	48
13	8.32 702	599	8.32 711	599	1.67 289	9.99 990	47
14	8.33 292	590	8.33 302	591	1.66 698	9.99 990	46
15	8.33 875	583	8.33 886	584	1.66 114	9.99 990	45
16	8.34 450	575	8.34 461	575	1.65 539	9.99 989	44
17	8.35 018	568	8.35 029	568	1.64 971	9.99 989	43
18	8.35 578	560	8.35 590	561	1.64 410	9.99 989	42
19	8.36 131	553	8.36 143	553	1.63 857	9.99 989	41
20	8.36 678	547.	8.36 689	546	1.63 311	9.99 988	40
21	8.37 217	539	8.37 229	540	1.62 771	9.99 988	39
22	8.37 750	533	8.37 762	533	1.62 238	9.99 988	38
23	8.38 276	526	8.38 289	527	1.61 711	9.99 987	37
24	8.38 796	520	8.38 809	520	1.61 191	9.99 987	36
25	8.39 310	514	8.39 323	514	1.60 677	9.99 987	35
26	8.39 818	508	8.39 832	509	1.60 168	9.99 986	34
27	8.40 320	502	8.40 334	502	1.59 666	9.99 986	33
28	8.40 816	496	8.40 830	496	1.59 170	9.99 986	32
29	8.41 307	491	8.41 321	491	1.58 679	9.99 985	31
30	8.41 792	485	8.41 807	486	1.58 193	9.99 985	30
31	8.42 272	480	8.42 287	480	1.57 713	9.99 985	29
32	8.42 746	474	8.42 762	475	1.57 238	9.99 984	28
33	8.43 216	470	8.43 232	470	1.56 768	9.99 984	27
34	8.43 680	464	8.43 696	464	1.56 304	9.99 984	26
35	8.44 139	459	8.44 156	460	1.55 844	9.99 983	25
36	8.44 594	455	8.44 611	455	1.55 389	9.99 983	24
37	8.45 044	450	8.45 061	450	1.54 939	9.99 983	23
38	8.45 489	445	8.45 507	446	1.54 493	9.99 982	22
39	8.45 930	441	8.45 948	441	1.54 052	9.99 982	21
40	8.46 366	436	8.46 385	437	1.53 615	9.99 982	20
41	8.46 799	433	8.46 817	432	1.53 183	9.99 981	19
42	8.47 226	427	8.47 245	428	1.52 755	9.99 981	18
43	8.47 650	424	8.47 669	424	1.52 331	9.99 981	17
44	8.48 069	419	8.48 089	420	1.51 911	9.99 980	16
45	8.48 485	416	8.48 505	416	1.51 495	9.99 980	15
46	8.48 896	411	8.48 917	412	1.51 083	9.99 979	14
47	8.49 304	408	8.49 325	408	1.50 675	9.99 979	13
48	8.49 708	404	8.49 729	404	1.50 271	9.99 979	12
49	8.50 108	400	8.50 130	401	1.49 870	9.99 978	11
50	8.50 504	396	8.50 527	397	1.49 473	9.99 978	10
51	8.50 897	393	8.50 920	393	1.49 080	9.99 977	9
52	8.51 287	390	8.51 310	390	1.48 690	9.99 977	8
53	8.51 673	386	8.51 696	386	1.48 304	9.99 977	7
54	8.52 055	382	8.52 079	383	1.47 921	9.99 976	6
55	8.52 434	379	8.52 459	380	1.47 541	9.99 976	5
56	8.52 810	376	8.52 835	376	1.47 165	9.99 975	4
57	8.53 183	373	8.53 208	373	1.46 792	9.99 975	3
58	8.53 552	369	8.53 578	370	1.46 422	9.99 974	2
59	8.53 919	367	8.53 945	367	1.46 055	9.99 974	1
60	8.54 282		8.54 308		1.45 692	9.99 974	0
	L Cos	d	L Cot	c d	L Tan	L Sin	/

/	L Sin	d	L Tan	c d	L Cot	L Cos		P P
0	8.54 282		8.54 308		1.45 692	9.99 974	60	
1	8.54 642	360	8.54 669	361	1.45 331	9.99 973	59	
2	8.54 999	357	8.55 027	358	1.44 973	9.99 973	58	
3	8.55 354	355	8.55 382	355	1.44 618	9.99 972	57	
4	8.55 705	351	8.55 734	352	1.44 266	9.99 972	56	
5	8.56 054	349	8.56 083	349	1.43 917	9.99 971	55	
6	8.56 400	346	8.56 429	346	1.43 571	9.99 971	54	
7	8.56 743	343	8.56 773	344	1.43 227	9.99 970	53	
8	8.57 084	341	8.57 114	341	1.42 886	9.99 970	52	
9	8.57 421	337	8.57 452	338	1.42 548	9.99 969	51	
10	8.57 757	336	8.57 788	336	1.42 212	9.99 969	50	
11	8.58 089	332	8.58 121	333	1.41 879	9.99 968	49	
12	8.58 419	330	8.58 451	330	1.41 549	9.99 968	48	
13	8.58 747	328	8.58 779	328	1.41 221	9.99 967	47	
14	8.59 072	325	8.59 105	326	1.40 895	9.99 967	46	
15	8.59 395	323	8.59 428	323	1.40 572	9.99 967	45	
16	8.59 715	320	8.59 749	321	1.40 251	9.99 966	44	
17	8.60 033	318	8.60 068	319	1.39 932	9.99 966	43	
18	8.60 349	316	8.60 384	316	1.39 616	9.99 965	42	
19	8.60 662	313	8.60 698	314	1.39 302	9.99 964	41	
20	8.60 973	311	8.61 009	311	1.38 991	9.99 964	40	
21	8.61 282	309	8.61 319	310	1.38 681	9.99 963	39	
22	8.61 580	307	8.61 626	307	1.38 374	9.99 963	38	
23	8.61 894	305	8.61 931	305	1.38 069	9.99 962	37	
24	8.62 196	302	8.62 234	303	1.37 766	9.99 962	36	
25	8.62 497	301	8.62 535	301	1.37 465	9.99 961	35	
26	8.62 795	298	8.62 834	299	1.37 166	9.99 961	34	
27	8.63 091	296	8.63 131	297	1.36 869	9.99 960	33	
28	8.63 385	294	8.63 426	295	1.36 574	9.99 960	32	
29	8.63 678	293	8.63 718	292	1.36 282	9.99 959	31	
30	8.63 968	290	8.64 009	291	1.35 991	9.99 959	30	
31	8.64 256	288	8.64 298	289	1.35 702	9.99 958	29	
32	8.64 543	287	8.64 585	287	1.35 415	9.99 958	28	
33	8.64 827	284	8.64 870	285	1.35 130	9.99 957	27	
34	8.65 110	283	8.65 154	284	1.34 846	9.99 956	26	
35	8.65 391	281	8.65 435	281	1.34 565	9.99 956	25	
36	8.65 670	279	8.65 715	278	1.34 285	9.99 955	24	
37	8.65 947	277	8.65 993	276	1.34 007	9.99 955	23	
38	8.66 223	276	8.66 266	276	1.33 737	9.99 954	22	
39	8.66 497	274	8.66 543	274	1.33 457	9.99 954	21	
40	8.66 769	272	8.66 816	273	1.33 184	9.99 953	20	
41	8.67 039	270	8.67 087	271	1.32 913	9.99 952	19	
42	8.67 308	269	8.67 356	269	1.32 644	9.99 952	18	
43	8.67 575	267	8.67 624	268	1.32 376	9.99 951	17	
44	8.67 841	266	8.67 890	266	1.32 110	9.99 951	16	
45	8.68 104	263	8.68 154	264	1.31 846	9.99 950	15	
46	8.68 367	263	8.68 417	263	1.31 583	9.99 949	14	
47	8.68 627	260	8.68 678	261	1.31 322	9.99 949	13	
48	8.68 886	259	8.68 938	260	1.31 062	9.99 948	12	
49	8.69 144	258	8.69 196	258	1.30 804	9.99 948	11	
50	8.69 400	256	8.69 453	257	1.30 547	9.99 947	10	
51	8.69 654	254	8.69 708	255	1.30 292	9.99 946	9	
52	8.69 907	253	8.69 962	254	1.30 038	9.99 946	8	
53	8.70 159	252	8.70 214	252	1.29 786	9.99 945	7	
54	8.70 409	250	8.70 465	251	1.29 535	9.99 944	6	
55	8.70 658	249	8.70 714	249	1.29 286	9.99 944	5	
56	8.70 905	247	8.70 962	248	1.29 038	9.99 943	4	
57	8.71 151	246	8.71 208	246	1.28 792	9.99 942	3	
58	8.71 395	244	8.71 453	245	1.28 547	9.99 942	2	
59	8.71 638	243	8.71 697	244	1.28 303	9.99 941	1	
60	8.71 880	242			1.28 060	9.99 940	0	
	L Cos	d	L Cot	c d	L Tan	L Sin	/	P P

	L Sin	d	L Tan	c d	L Cot	L Cos		P P					
O	8.71 880	240	8.71 940	241	1.28 060	9.99 940	60	241	239	237	236	234	
1	8.72 120	239	8.72 181	239	1.27 819	9.99 940	59	241	239	237	236	234	
2	8.72 359	238	8.72 420	239	1.27 580	9.99 939	58	241	239	237	236	234	
3	8.72 597	237	8.72 659	237	1.27 341	9.99 938	57	241	239	237	236	234	
4	8.72 834	235	8.72 896	236	1.27 104	9.99 938	56	241	239	237	236	234	
5	8.73 069	234	8.73 132	234	1.26 868	9.99 937	55	241	239	237	236	234	
6	8.73 303	232	8.73 366	234	1.26 634	9.99 936	54	241	239	237	236	234	
7	8.73 535	232	8.73 600	232	1.26 400	9.99 936	53	241	239	237	236	234	
8	8.73 767	230	8.73 832	231	1.26 168	9.99 935	52	241	239	237	236	234	
9	8.73 997	229	8.74 063	229	1.25 937	9.99 934	51	241	239	237	236	234	
10	8.74 226	228	8.74 292	229	1.25 708	9.99 934	50	241	239	237	236	234	
11	8.74 454	226	8.74 521	227	1.25 479	9.99 933	49	241	239	237	236	234	
12	8.74 680	226	8.74 748	226	1.25 252	9.99 932	48	241	239	237	236	234	
13	8.74 906	224	8.74 974	225	1.25 026	9.99 932	47	241	239	237	236	234	
14	8.75 130	223	8.75 199	224	1.24 801	9.99 931	46	241	239	237	236	234	
15	8.75 353	222	8.75 423	222	1.24 577	9.99 930	45	241	239	237	236	234	
16	8.75 575	220	8.75 645	222	1.24 355	9.99 929	44	241	239	237	236	234	
17	8.75 795	220	8.75 867	220	1.24 133	9.99 929	43	241	239	237	236	234	
18	8.76 015	219	8.76 087	219	1.23 913	9.99 928	42	241	239	237	236	234	
19	8.76 234	217	8.76 306	219	1.23 694	9.99 927	41	241	239	237	236	234	
20	8.76 451	216	8.76 525	217	1.23 475	9.99 926	40	241	239	237	236	234	
21	8.76 667	216	8.76 742	216	1.23 258	9.99 926	39	241	239	237	236	234	
22	8.76 883	214	8.76 958	215	1.23 042	9.99 925	38	241	239	237	236	234	
23	8.77 097	213	8.77 173	214	1.22 827	9.99 924	37	241	239	237	236	234	
24	8.77 310	212	8.77 387	213	1.22 613	9.99 923	36	241	239	237	236	234	
25	8.77 522	211	8.77 600	213	1.22 400	9.99 923	35	241	239	237	236	234	
26	8.77 733	210	8.77 811	211	1.22 180	9.99 922	34	241	239	237	236	234	
27	8.77 943	209	8.78 022	210	1.21 978	9.99 921	33	241	239	237	236	234	
28	8.78 152	208	8.78 232	209	1.21 768	9.99 920	32	241	239	237	236	234	
29	8.78 360	208	8.78 441	208	1.21 559	9.99 920	31	241	239	237	236	234	
30	8.78 568	206	8.78 649	206	1.21 351	9.99 919	30	241	239	237	236	234	
31	8.78 774	205	8.78 855	206	1.21 145	9.99 918	29	241	239	237	236	234	
32	8.78 979	204	8.79 061	205	1.20 939	9.99 917	28	241	239	237	236	234	
33	8.79 183	203	8.79 266	205	1.20 734	9.99 917	27	241	239	237	236	234	
34	8.79 386	202	8.79 470	203	1.20 530	9.99 916	26	241	239	237	236	234	
35	8.79 588	201	8.79 673	203	1.20 327	9.99 915	25	241	239	237	236	234	
36	8.79 789	201	8.79 875	202	1.20 125	9.99 914	24	241	239	237	236	234	
37	8.79 990	199	8.80 076	201	1.19 924	9.99 913	23	241	239	237	236	234	
38	8.80 189	199	8.80 277	201	1.19 723	9.99 913	22	241	239	237	236	234	
39	8.80 388	197	8.80 476	199	1.19 524	9.99 912	21	241	239	237	236	234	
40	8.80 585	197	8.80 674	198	1.19 326	9.99 911	20	241	239	237	236	234	
41	8.80 782	196	8.80 872	196	1.19 128	9.99 910	19	241	239	237	236	234	
42	8.80 978	195	8.81 068	196	1.18 932	9.99 909	18	241	239	237	236	234	
43	8.81 173	194	8.81 264	195	1.18 736	9.99 909	17	241	239	237	236	234	
44	8.81 367	193	8.81 459	194	1.18 541	9.99 908	16	241	239	237	236	234	
45	8.81 560	193	8.81 653	194	1.18 347	9.99 907	15	241	239	237	236	234	
46	8.81 752	192	8.81 846	193	1.18 154	9.99 906	14	241	239	237	236	234	
47	8.81 944	190	8.82 038	192	1.17 962	9.99 905	13	241	239	237	236	234	
48	8.82 134	190	8.82 230	192	1.17 770	9.99 904	12	241	239	237	236	234	
49	8.82 324	189	8.82 420	190	1.17 580	9.99 904	11	241	239	237	236	234	
50	8.82 513	188	8.82 610	189	1.17 390	9.99 903	10	241	239	237	236	234	
51	8.82 701	187	8.82 799	188	1.17 201	9.99 902	9	241	239	237	236	234	
52	8.82 888	187	8.82 987	188	1.17 013	9.99 901	8	241	239	237	236	234	
53	8.83 075	186	8.83 175	186	1.16 825	9.99 900	7	241	239	237	236	234	
54	8.83 261	185	8.83 361	186	1.16 639	9.99 899	6	241	239	237	236	234	
55	8.83 446	185	8.83 547	185	1.16 453	9.99 898	5	241	239	237	236	234	
56	8.83 630	184	8.83 732	184	1.16 268	9.99 898	4	241	239	237	236	234	
57	8.83 813	183	8.83 916	184	1.16 084	9.99 897	3	241	239	237	236	234	
58	8.83 996	183	8.84 100	182	1.15 900	9.99 896	2	241	239	237	236	234	
59	8.84 177	181	8.84 282	182	1.15 718	9.99 895	1	241	239	237	236	234	
60	8.84 358	—	8.84 464	—	1.15 536	9.99 894	O	241	239	237	236	234	
	L Cos	d	L Cot	c'd	L Tan	L Sin	I	P P	·	·	·	·	·

	L Sin	d	L Tan	c d	L Cot	L Cos		P P
O	8.84 358	181	8.84 464	182	1.15 536	9.99 894	60	182 181 180 179 178
1	8.84 539	170	8.84 646	180	1.15 354	9.99 893	59	18.2 18.1 18.0 17.9 17.8
2	8.84 718	170	8.84 826	180	1.15 174	9.99 892	58	36.4 36.2 36.0 35.8 35.6
3	8.84 897	178	8.85 006	180	1.14 994	9.99 891	57	54.6 54.3 54.0 53.7 53.4
4	8.85 075	177	8.85 185	179	1.14 815	9.99 891	56	72.8 72.4 72.0 71.6 71.2
5	8.85 252	177	8.85 363	178	1.14 637	9.99 890	55	91.0 90.5 90.0 89.5 89.0
6	8.85 429	176	8.85 540	177	1.14 460	9.99 889	54	109.2 108.6 108.0 107.4 106.8
7	8.85 605	175	8.85 717	176	1.14 283	9.99 888	53	127.4 126.7 126.0 125.3 124.6
8	8.85 780	175	8.85 893	176	1.14 107	9.99 887	52	145.6 144.8 144.0 143.2 142.4
9	8.85 955	175	8.86 069	176	1.13 931	9.99 886	51	163.8 162.9 162.0 161.1 160.2
10	8.86 128	173	8.86 243	174	1.13 757	9.99 885	50	177 176 175 174 173
11	8.86 301	173	8.86 417	174	1.13 583	9.99 884	49	17.7 17.6 17.5 17.4 17.3
12	8.86 474	173	8.86 591	174	1.13 409	9.99 883	48	35.4 35.2 35.0 34.8 34.6
13	8.86 645	171	8.86 763	172	1.13 237	9.99 882	47	53.1 52.8 52.5 52.2 51.9
14	8.86 816	171	8.86 935	172	1.13 065	9.99 881	46	70.8 70.4 70.0 69.6 69.2
15	8.86 987	171	8.87 106	171	1.12 894	9.99 880	45	88.5 88.0 87.5 87.0 86.5
16	8.87 156	169	8.87 277	170	1.12 723	9.99 879	44	106.0 105.6 105.0 104.4 103.8
17	8.87 325	169	8.87 447	169	1.12 553	9.99 879	43	123.9 123.2 122.5 121.8 121.1
18	8.87 494	167	8.87 616	169	1.12 384	9.99 878	42	141.6 140.8 140.0 139.2 138.4
19	8.87 601	168	8.87 785	168	1.12 215	9.99 877	41	150.3 158.4 157.5 156.6 155.7
20	8.87 829	166	8.87 953	167	1.12 047	9.99 876	40	172 171 170 169 168
21	8.87 995	166	8.88 120	167	1.11 880	9.99 875	39	17.2 17.1 17.0 16.9 16.8
22	8.88 161	165	8.88 287	166	1.11 713	9.99 874	38	34.4 34.2 34.0 33.8 33.6
23	8.88 326	164	8.88 453	165	1.11 547	9.99 873	37	51.6 51.3 51.0 50.7 50.4
24	8.88 490	164	8.88 618	165	1.11 382	9.99 872	36	68.8 68.4 68.0 67.6 67.2
25	8.88 654	164	8.88 783	165	1.11 217	9.99 871	35	86.0 85.5 85.0 84.5 84.0
26	8.88 817	163	8.88 948	163	1.11 052	9.99 870	34	103.2 102.6 102.0 101.4 100.8
27	8.88 980	162	8.89 111	163	1.10 880	9.99 869	33	120.4 119.7 119.0 118.3 117.6
28	8.89 142	162	8.89 274	163	1.10 726	9.99 868	32	137.6 136.8 136.0 135.2 134.4
29	8.89 304	160	8.89 437	161	1.10 563	9.99 867	31	154.8 153.9 153.0 152.1 151.2
30	8.89 464	161	8.89 598	162	1.10 402	9.99 866	30	167 166 165 164 163
31	8.89 625	159	8.89 760	160	1.10 240	9.99 865	29	16.7 16.6 16.5 16.4 16.3
32	8.89 784	159	8.89 920	160	1.10 080	9.99 864	28	33.4 33.2 33.0 32.8 32.6
33	8.89 943	159	8.90 080	160	1.10 920	9.99 863	27	50.1 49.8 49.5 49.2 48.0
34	8.90 102	158	8.90 240	159	1.09 760	9.99 862	26	66.8 66.4 66.0 65.6 65.2
35	8.90 260	158	8.90 399	159	1.09 601	9.99 861	25	83.5 83.0 82.5 82.0 81.5
36	8.90 417	157	8.90 557	158	1.09 443	9.99 860	24	100.2 99.6 99.0 98.4 97.8
37	8.90 574	156	8.90 715	157	1.09 285	9.99 859	23	116.9 116.2 115.5 114.8 114.1
38	8.90 730	155	8.90 872	157	1.09 128	9.99 858	22	133.6 132.8 132.0 131.2 130.4
39	8.90 885	155	8.91 029	156	1.08 971	9.99 857	21	150.3 149.4 148.5 147.6 146.7
40	8.91 040	155	8.91 185	155	1.08 815	9.99 856	20	162 161 160 159 158
41	8.91 195	154	8.91 340	155	1.08 660	9.99 855	19	16.2 16.1 16.0 15.9 15.8
42	8.91 349	153	8.91 495	155	1.08 505	9.99 854	18	32.4 32.2 32.0 31.8 31.6
43	8.91 502	153	8.91 650	153	1.08 350	9.99 853	17	48.6 48.3 48.0 47.7 47.4
44	8.91 655	152	8.91 803	154	1.08 197	9.99 852	16	64.8 64.4 64.0 63.6 63.2
45	8.91 807	152	8.91 957	153	1.08 043	9.99 851	15	81.0 80.5 80.0 79.5 79.0
46	8.91 959	152	8.92 110	153	1.07 890	9.99 850	14	97.2 96.6 96.0 95.4 94.8
47	8.92 110	151	8.92 262	152	1.07 738	9.99 848	13	113.4 112.7 112.0 111.3 110.6
48	8.92 261	151	8.92 414	151	1.07 586	9.99 847	12	129.6 128.8 128.0 127.2 126.4
49	8.92 411	150	8.92 565	151	1.07 435	9.99 846	11	145.8 144.9 144.0 143.1 142.2
50	8.92 561	149	8.92 716	150	1.07 284	9.99 845	10	157 156 155 154 153
51	8.92 710	149	8.92 866	150	1.07 134	9.99 844	9	15.7 15.6 15.5 15.4 15.3
52	8.92 859	148	8.93 016	149	1.06 984	9.99 843	8	31.4 31.2 31.0 30.8 30.6
53	8.93 007	147	8.93 165	148	1.06 835	9.99 842	7	47.1 46.8 46.5 46.2 45.9
54	8.93 154	147	8.93 313	147	1.06 687	9.99 841	6	62.8 62.4 62.0 61.6 61.2
55	8.93 301	147	8.93 462	149	1.06 538	9.99 840	5	78.5 78.0 77.5 77.0 76.5
56	8.93 448	147	8.93 609	147	1.06 391	9.99 839	4	94.2 93.6 93.0 92.4 91.8
57	8.93 594	146	8.93 756	147	1.06 244	9.99 838	3	109.9 109.2 108.5 107.8 107.1
58	8.93 740	145	8.93 903	146	1.06 097	9.99 837	2	125.6 124.8 124.0 123.2 122.4
59	8.93 885	145	8.94 049	146	1.05 951	9.99 836	1	141.3 140.4 139.5 138.6 137.7
60	8.94 030		8.94 195		1.05 805	9.99 834	O	152 151 150 149 148
	L Cos	d	L Cot	c d	L Tan	L Sin	/	P P

/	L Sin	d	L Tan	c d	L Cot	L Cos		P P
0	8.94 030		8.94 195		1.05 805	9.99 834	60	147 146 145 144
1	8.94 174	144	8.94 340	145	1.05 660	9.99 833	59	1 14.7 14.6 14.5 14.4
2	8.94 317	143	8.94 485	145	1.05 515	9.99 832	58	2 20.4 29.2 29.0 28.8
3	8.94 461	144	8.94 630	145	1.05 370	9.99 831	57	3 44.1 43.8 43.5 43.2
4	8.94 603	142	8.94 773	143	1.05 227	9.99 830	56	4 58.8 58.4 58.0 57.6
5	8.94 746	143	8.94 917	144	1.05 083	9.99 829	55	5 73.5 73.0 72.5 72.0
6	8.94 887	141	8.95 060	143	1.04 940	9.99 828	54	6 88.2 87.6 87.0 86.4
7	8.95 029	142	8.95 202	142	1.04 798	9.99 827	53	7 102.9 102.2 101.5 100.8
8	8.95 170	141	8.95 344	142	1.04 656	9.99 825	52	8 117.6 116.8 116.0 115.2
9	8.95 310	140	8.95 486	142	1.04 514	9.99 824	51	9 132.3 131.4 130.5 129.6
10	8.95 450		8.95 627	140	1.04 373	9.99 823	50	143 142 141 140
11	8.95 589		8.95 767		1.04 233	9.99 822	49	1 14.3 14.2 14.1 14.0
12	8.95 728	139	8.95 908	141	1.04 092	9.99 821	48	2 28.6 28.4 28.2 28.0
13	8.95 867	139	8.96 047	139	1.03 953	9.99 820	47	3 42.9 42.6 42.3 42.0
14	8.96 005	138	8.96 187	140	1.03 813	9.99 819	46	4 57.2 56.8 56.4 56.0
15	8.96 143	138	8.96 325	138	1.03 675	9.99 817	45	5 71.5 71.0 70.5 70.0
16	8.96 280	137	8.96 464	139	1.03 536	9.99 816	44	6 85.8 85.2 84.6 84.0
17	8.96 417		8.96 602		1.03 398	9.99 815	43	7 100.1 99.4 98.7 98.0
18	8.96 553	136	8.96 739	137	1.03 261	9.99 814	42	8 114.4 113.6 112.8 112.0
19	8.96 689	136	8.96 877	138	1.03 123	9.99 813	41	9 128.7 127.8 126.9 126.0
20	8.96 825		8.97 013	137	1.02 987	9.99 812	40	139 138 137 136
21	8.96 960		8.97 150		1.02 850	9.99 810	39	1 13.0 13.8 13.7 13.6
22	8.97 095	135	8.97 285	135	1.02 715	9.99 809	38	2 27.8 27.6 27.4 27.2
23	8.97 229	134	8.97 421	136	1.02 579	9.99 808	37	3 41.7 41.4 41.1 40.8
24	8.97 363		8.97 556		1.02 444	9.99 807	36	4 55.6 55.2 54.8 54.4
25	8.97 496	133	8.97 691	135	1.02 309	9.99 806	35	5 69.5 69.0 68.5 68.0
26	8.97 629	133	8.97 825	134	1.02 175	9.99 804	34	6 83.4 82.8 82.2 81.6
27	8.97 762		8.97 959		1.02 041	9.99 803	33	7 97.3 96.6 95.9 95.2
28	8.97 894	132	8.98 092	133	1.01 908	9.99 802	32	8 111.2 110.4 109.6 108.8
29	8.98 026	132	8.98 225	133	1.01 775	9.99 801	31	9 125.1 124.2 123.3 122.4
30	8.98 157	131	8.98 358	132	1.01 642	9.99 800	30	135 134 133 132
31	8.98 288		8.98 490		1.01 510	9.99 798	29	1 13.5 13.4 13.3 13.2
32	8.98 419	131	8.98 622	132	1.01 378	9.99 797	28	2 27.0 26.8 26.6 26.4
33	8.98 549	130	8.98 753	131	1.01 247	9.99 796	27	3 40.5 40.2 39.9 39.6
34	8.98 679		8.98 884		1.01 116	9.99 795	26	4 54.0 53.6 53.2 52.8
35	8.98 808	129	8.99 015	131	1.00 985	9.99 793	25	5 67.5 67.0 66.5 66.0
36	8.98 937	129	8.99 145	130	1.00 855	9.99 792	24	6 81.0 80.4 79.8 79.2
37	8.99 066		8.99 275		1.00 725	9.99 791	22	7 94.5 93.8 93.1 92.4
38	8.99 194	128	8.99 405	130	1.00 595	9.99 790	21	8 108.0 107.2 106.4 105.6
39	8.99 322	128	8.99 534	128	1.00 466	9.99 788	20	9 121.5 120.6 119.7 118.8
40	8.99 450		8.99 662	129	1.00 338	9.99 787	19	131 130 129 128
41	8.99 577	127	8.99 791	128	1.00 209	9.99 786	18	1 13.1 13.0 12.9 12.8
42	8.99 704	126	8.99 919	127	1.00 081	9.99 785	17	2 26.2 26.0 25.8 25.6
43	8.99 830	126	9.00 046	126	0.99 954	9.99 783	16	3 39.3 39.0 38.7 38.4
44	8.99 956		9.00 174		0.99 826	9.99 782	15	4 52.4 52.0 51.6 51.2
45	9.00 082	126	9.00 301	127	0.99 609	9.99 781	14	5 65.5 65.0 64.5 64.0
46	9.00 207	125	9.00 427	126	0.99 573	9.99 780	13	6 78.6 78.0 77.4 76.8
47	9.00 332		9.00 553		0.99 447	9.99 778	12	7 91.7 91.0 90.3 89.6
48	9.00 456	124	9.00 679	126	0.99 321	9.99 777	11	8 104.8 104.0 103.2 102.4
49	9.00 581	125	9.00 805	125	0.99 195	9.99 776	10	9 117.9 117.0 116.1 115.2
50	9.00 704	124	9.00 930	125	0.99 070	9.99 775	9	127 126 125 124
51	9.00 828		9.01 055		0.98 945	9.99 773	8	123 122 121 120
52	9.00 951	123	9.01 179	124	0.98 821	9.99 772	7	2 25.4 25.2 24.9 24.6
53	9.01 074	123	9.01 303	124	0.98 697	9.99 771	6	3 38.1 37.8 37.5 37.2
54	9.01 196		9.01 427		0.98 573	9.99 769	5	4 50.8 50.4 50.0 49.6
55	9.01 318	122	9.01 550	123	0.98 450	9.99 768	4	5 63.5 63.0 62.5 62.0
56	9.01 440	122	9.01 673	123	0.98 327	9.99 767	3	6 76.2 75.6 75.0 74.4
57	9.01 561		9.01 796		0.98 204	9.99 765	2	7 88.9 88.2 87.5 86.8
58	9.01 682	121	9.01 918	122	0.98 082	9.99 764	1	8 101.6 100.8 100.0 99.2
59	9.01 803	120	9.02 040	122	0.97 960	9.99 763	0	9 110.7 109.8 108.9 108.0
60	9.01 923		9.02 162		0.97 838	9.99 761	0	123 122 121 120
	L Cos	d	L Cot	c d	L Tan	L Sin	/	P P

/	L Sin	d	L Tan	c d	L Cot	L Cos		P P				
O	9.01 923		9.02 162		0.97 838	9.99 761	60					
1	9.02 043	120	9.02 283	121	0.97 717	9.99 760	59					
2	9.02 163	120	9.02 404	121	0.97 596	9.99 759	58					
3	9.02 283	119	9.02 525	121	0.97 475	9.99 757	57					
4	9.02 402	118	9.02 645	121	0.97 355	9.99 756	56					
5	9.02 520	119	9.02 766	121	0.97 234	9.99 755	55					
6	9.02 639	118	9.02 885	119	0.97 115	9.99 753	54					
7	9.02 757	117	9.03 005	119	0.96 995	9.99 752	53					
8	9.02 874	118	9.03 124	118	0.96 876	9.99 751	52					
9	9.02 992	117	9.03 242	119	0.96 758	9.99 749	51					
IO	9.03 109		9.03 361		0.96 639	9.99 748	50					
11	9.03 226	117	9.03 479	118	0.96 521	9.99 747	49					
12	9.03 342	116	9.03 597	117	0.96 403	9.99 745	48					
13	9.03 458	116	9.03 714	116	0.96 286	9.99 744	47					
14	9.03 574	116	9.03 832	116	0.96 168	9.99 742	46					
15	9.03 690	115	9.03 948	116	0.96 052	9.99 741	45					
16	9.03 805	115	9.04 065	117	0.95 935	9.99 740	44					
17	9.03 920	115	9.04 181	116	0.95 819	9.99 738	43					
18	9.04 034	114	9.04 297	116	0.95 703	9.99 737	42					
19	9.04 149	115	9.04 413	115	0.95 587	9.99 736	41					
20	9.04 262		9.04 528		0.95 472	9.99 734	40					
21	9.04 376	114	9.04 643	115	0.95 357	9.99 733	39					
22	9.04 490	113	9.04 758	115	0.95 242	9.99 731	38					
23	9.04 603	112	9.04 873	114	0.95 127	9.99 730	37					
24	9.04 715	113	9.04 987	114	0.95 013	9.99 728	36					
25	9.04 828	113	9.05 101	114	0.94 899	9.99 727	35					
26	9.04 940	112	9.05 214	114	0.94 786	9.99 726	34					
27	9.05 052	112	9.05 328	113	0.94 672	9.99 724	33					
28	9.05 164	111	9.05 441	112	0.94 559	9.99 723	32					
29	9.05 275	111	9.05 553	113	0.94 447	9.99 721	31					
30	9.05 386		9.05 666		0.94 334	9.99 720	30					
31	9.05 497	110	9.05 778	112	0.94 222	9.99 718	29					
32	9.05 607	110	9.05 890	112	0.94 110	9.99 717	28					
33	9.05 717	110	9.06 002	111	0.93 998	9.99 716	27					
34	9.05 827	110	9.06 113	111	0.93 887	9.99 714	26					
35	9.05 937	109	9.06 224	111	0.93 776	9.99 713	25					
36	9.06 046	109	9.06 335	110	0.93 665	9.99 711	24					
37	9.06 155	109	9.06 445	111	0.93 555	9.99 710	23					
38	9.06 264	108	9.06 556	110	0.93 444	9.99 708	22					
39	9.06 372	109	9.06 666	109	0.93 334	9.99 707	21					
40	9.06 481		9.06 775		0.93 225	9.99 705	20					
41	9.06 589	107	9.06 885	109	0.93 115	9.99 704	19					
42	9.06 696	108	9.06 994	109	0.93 006	9.99 702	18					
43	9.06 804	107	9.07 103	108	0.92 897	9.99 701	17					
44	9.06 911	107	9.07 211	106	0.92 789	9.99 699	16					
45	9.07 018	106	9.07 320	108	0.92 680	9.99 698	15					
46	9.07 124	107	9.07 428	108	0.92 572	9.99 696	14					
47	9.07 231	106	9.07 536	107	0.92 464	9.99 695	13					
48	9.07 337	105	9.07 643	108	0.92 357	9.99 693	12					
49	9.07 442	106	9.07 751	107	0.92 249	9.99 692	11					
50	9.07 548		9.07 858		0.92 142	9.99 690	10					
51	9.07 653	105	9.07 964	107	0.92 036	9.99 689	9					
52	9.07 758	105	9.08 071	106	0.91 929	9.99 687	8					
53	9.07 863	105	9.08 177	106	0.91 823	9.99 686	7					
54	9.07 968	104	9.08 283	106	0.91 717	9.99 684	6					
55	9.08 072	104	9.08 389	106	0.91 611	9.99 683	5					
56	9.08 176	104	9.08 495	105	0.91 505	9.99 681	4					
57	9.08 280		9.08 600	105	0.91 400	9.99 680	3					
58	9.08 383	103	9.08 705	105	0.91 295	9.99 678	2					
59	9.08 486	103	9.08 810	104	0.91 190	9.99 677	1					
60	9.08 589		9.08 914		0.91 086	9.99 675	0					
	L Cos	d	L Cot	c d	L Tan	L Sin	/	P P				

/	L Sin	d	L Tan	c d	L Cot	L Cos		P P			
0	9.08 589	103	9.08 914	105	0.91 086	9.99 675	60				
1	9.08 692	103	9.09 019	104	0.90 981	9.99 674	59				
2	9.08 795	103	9.09 123	102	0.90 877	9.99 672	58				
3	9.08 897	102	9.09 227	103	0.90 773	9.99 670	57				
4	9.08 999	102	9.09 330	104	0.90 670	9.99 669	56				
5	9.09 101	102	9.09 434	103	0.90 566	9.99 667	55	1	10.5	10.4	10.3
6	9.09 202	101	9.09 537	103	0.90 463	9.99 666	54	2	21.0	20.8	20.6
7	9.09 304	101	9.09 640	102	0.90 360	9.99 664	53	3	31.5	31.2	30.9
8	9.09 405	101	9.09 742	102	0.90 258	9.99 663	52	4	42.0	41.6	41.2
9	9.09 506	100	9.09 845	103	0.90 155	9.99 661	51	5	52.5	52.0	51.5
10	9.09 606	101	9.09 947	102	0.90 053	9.99 659	50	6	63.0	62.4	61.8
11	9.09 707	100	9.10 049	101	0.89 951	9.99 658	49	7	73.5	72.8	72.1
12	9.09 807	100	9.10 150	102	0.89 850	9.99 656	48	8	84.0	83.2	82.4
13	9.09 907	99	9.10 252	101	0.89 748	9.99 655	47	9	94.5	93.6	92.7
14	9.10 006	100	9.10 353	101	0.89 647	9.99 653	46				
15	9.10 106	99	9.10 454	101	0.89 546	9.99 651	45				
16	9.10 205	99	9.10 555	101	0.89 445	9.99 650	44	1	10.2	10.1	9.9
17	9.10 304	98	9.10 656	100	0.89 344	9.99 648	43	2	20.4	20.2	19.8
18	9.10 402	98	9.10 756	100	0.89 244	9.99 647	42	3	30.6	30.3	29.7
19	9.10 501	98	9.10 856	100	0.89 144	9.99 645	41	4	40.8	40.4	39.6
20	9.10 599	98	9.10 956	100	0.89 044	9.99 643	40	5	51.0	50.5	49.5
21	9.10 697	98	9.11 056	99	0.88 944	9.99 642	39	6	61.2	60.6	59.4
22	9.10 795	98	9.11 155	99	0.88 845	9.99 640	38	7	71.4	70.7	69.3
23	9.10 893	97	9.11 254	99	0.88 746	9.99 638	37	8	81.6	80.8	79.2
24	9.10 990	97	9.11 353	99	0.88 647	9.99 637	36	9	91.8	90.9	89.1
25	9.11 087	97	9.11 452	99	0.88 548	9.99 635	35				
26	9.11 184	97	9.11 551	99	0.88 449	9.99 633	34				
27	9.11 281	97	9.11 649	98	0.88 351	9.99 632	33				
28	9.11 377	96	9.11 747	98	0.88 253	9.99 630	32	1	9.8	9.7	9.6
29	9.11 474	96	9.11 845	98	0.88 155	9.99 629	31	2	19.6	19.4	19.2
30	9.11 570	96	9.11 943	97	0.88 057	9.99 627	30	3	29.4	29.1	28.8
31	9.11 666	95	9.12 040	98	0.87 960	9.99 625	29	4	39.2	38.8	38.4
32	9.11 761	95	9.12 138	97	0.87 862	9.99 624	28	5	49.0	48.5	48.0
33	9.11 857	95	9.12 235	97	0.87 765	9.99 622	27	6	58.8	58.2	57.6
34	9.11 952	95	9.12 332	96	0.87 668	9.99 620	26	7	68.6	67.9	67.2
35	9.12 047	95	9.12 428	97	0.87 572	9.99 618	25	8	78.4	77.6	76.8
36	9.12 142	95	9.12 525	96	0.87 475	9.99 617	24	9	88.2	87.3	86.4
37	9.12 236	94	9.12 621	96	0.87 379	9.99 615	23				
38	9.12 331	95	9.12 717	96	0.87 283	9.99 613	22				
39	9.12 425	94	9.12 813	96	0.87 187	9.99 612	21				
40	9.12 519	93	9.12 909	95	0.87 091	9.99 610	20				
41	9.12 612	94	9.13 004	95	0.86 996	9.99 608	19	1	9.5	9.4	9.3
42	9.12 706	94	9.13 099	95	0.86 901	9.99 607	18	2	19.0	18.8	18.6
43	9.12 799	93	9.13 194	95	0.86 806	9.99 605	17	3	28.5	28.2	27.9
44	9.12 892	93	9.13 280	95	0.86 711	9.99 603	16	4	38.0	37.6	37.2
45	9.12 985	93	9.13 384	95	0.86 616	9.99 601	15	5	47.5	47.0	46.5
46	9.13 078	93	9.13 478	94	0.86 522	9.99 600	14	6	57.0	56.4	55.8
47	9.13 171	92	9.13 573	95	0.86 427	9.99 598	13	7	66.5	65.8	65.1
48	9.13 263	92	9.13 667	94	0.86 333	9.99 596	12	8	76.0	75.2	74.4
49	9.13 355	92	9.13 761	93	0.86 239	9.99 595	11	9	85.5	84.6	83.7
50	9.13 447	92	9.13 854	94	0.86 146	9.99 593	10				
51	9.13 539	91	9.13 948	93	0.86 052	9.99 591	9	1	9.2	9.1	9.0
52	9.13 630	92	9.14 041	93	0.85 959	9.99 589	8	2	18.4	18.2	18.0
53	9.13 722	91	9.14 134	93	0.85 866	9.99 588	7	3	27.6	27.3	27.0
54	9.13 813	91	9.14 227	93	0.85 773	9.99 586	6	4	36.8	36.4	36.0
55	9.13 904	90	9.14 320	92	0.85 680	9.99 584	5	5	46.0	45.5	45.0
56	9.13 994	91	9.14 412	92	0.85 588	9.99 582	4	6	55.2	54.6	54.0
57	9.14 085	90	9.14 504	93	0.85 496	9.99 581	3	7	64.4	63.7	63.0
58	9.14 175	90	9.14 597	91	0.85 403	9.99 579	2	8	73.6	72.8	72.0
59	9.14 266	91	9.14 688	92	0.85 312	9.99 577	1	9	82.8	81.9	81.0
60	9.14 356	—	9.14 780	—	0.85 220	9.99 575	0				
	L Cos	d	L Cot	c d	L Tan	L Sin	/	P P			

<i>l</i>	L Sin	<i>d</i>	L Tan	c d	L Cot	L Cos		P P		
0	9.14 356	89	9.14 780	92	0.85 220	9.99 575	60			
1	9.14 445	89	9.14 872	91	0.85 128	9.99 574	59			
2	9.14 535	90	9.14 903	91	0.85 037	9.99 572	58			
3	9.14 624	90	9.15 054	91	0.84 946	9.99 570	57			
4	9.14 714	90	9.15 145	91	0.84 855	9.99 568	56			
5	9.14 803	89	9.15 236	91	0.84 764	9.99 566	55			
6	9.14 891	88	9.15 327	91	0.84 673	9.99 565	54			
7	9.14 980	89	9.15 417	90	0.84 583	9.99 563	53			
8	9.15 069	89	9.15 508	91	0.84 492	9.99 561	52			
9	9.15 157	88	9.15 598	90	0.84 402	9.99 559	51			
10	9.15 245	88	9.15 688	89	0.84 312	9.99 557	50			
11	9.15 333	88	9.15 777	90	0.84 223	9.99 556	49			
12	9.15 421	88	9.15 867	90	0.84 133	9.99 554	48			
13	9.15 508	87	9.15 956	89	0.84 044	9.99 552	47			
14	9.15 596	88	9.16 046	89	0.83 954	9.99 550	46			
15	9.15 683	87	9.16 135	89	0.83 865	9.99 548	45			
16	9.15 770	87	9.16 224	88	0.83 776	9.99 546	44			
17	9.15 857	87	9.16 312	89	0.83 688	9.99 545	43			
18	9.15 944	87	9.16 401	89	0.83 599	9.99 543	42			
19	9.16 030	86	9.16 489	88	0.83 511	9.99 541	41			
20	9.16 116	87	9.16 577	88	0.83 423	9.99 539	40			
21	9.16 203	86	9.16 665	88	0.83 335	9.99 537	39			
22	9.16 289	86	9.16 753	88	0.83 247	9.99 535	38			
23	9.16 374	85	9.16 841	87	0.83 159	9.99 533	37			
24	9.16 460	85	9.16 928	88	0.83 072	9.99 532	36			
25	9.16 545	85	9.17 016	87	0.82 984	9.99 530	35			
26	9.16 631	86	9.17 103	87	0.82 897	9.99 528	34			
27	9.16 716	85	9.17 190	87	0.82 810	9.99 526	33			
28	9.16 801	85	9.17 277	86	0.82 723	9.99 524	32			
29	9.16 886	85	9.17 363	87	0.82 637	9.99 522	31			
30	9.16 970	85	9.17 450	86	0.82 550	9.99 520	30			
31	9.17 055	84	9.17 536	86	0.82 464	9.99 518	29			
32	9.17 139	84	9.17 622	86	0.82 378	9.99 517	28			
33	9.17 223	84	9.17 708	86	0.82 292	9.99 515	27			
34	9.17 307	84	9.17 794	86	0.82 206	9.99 513	26			
35	9.17 391	84	9.17 880	86	0.82 120	9.99 511	25			
36	9.17 474	84	9.17 965	86	0.82 035	9.99 509	24			
37	9.17 558	83	9.18 051	85	0.81 949	9.99 507	23			
38	9.17 641	83	9.18 136	85	0.81 864	9.99 505	22			
39	9.17 724	83	9.18 221	85	0.81 779	9.99 503	21			
40	9.17 807	83	9.18 306	85	0.81 694	9.99 501	20			
41	9.17 890	83	9.18 391	84	0.81 609	9.99 499	19			
42	9.17 973	83	9.18 475	85	0.81 525	9.99 497	18			
43	9.18 055	82	9.18 560	84	0.81 440	9.99 495	17			
44	9.18 137	83	9.18 644	84	0.81 356	9.99 494	16			
45	9.18 220	82	9.18 728	84	0.81 272	9.99 492	15			
46	9.18 302	81	9.18 812	84	0.81 188	9.99 490	14			
47	9.18 383	82	9.18 896	83	0.81 104	9.99 488	13			
48	9.18 465	82	9.18 979	84	0.81 021	9.99 486	12			
49	9.18 547	81	9.19 063	83	0.80 937	9.99 484	11			
50	9.18 628	81	9.19 146	83	0.80 854	9.99 482	10			
51	9.18 709	81	9.19 229	83	0.80 771	9.99 480	9			
52	9.18 790	81	9.19 312	83	0.80 688	9.99 478	8			
53	9.18 871	81	9.19 395	83	0.80 605	9.99 476	7			
54	9.18 952	81	9.19 478	83	0.80 522	9.99 474	6			
55	9.19 033	80	9.19 561	82	0.80 439	9.99 472	5			
56	9.19 113	80	9.19 643	82	0.80 357	9.99 470	4			
57	9.19 193	80	9.19 725	82	0.80 275	9.99 468	3			
58	9.19 273	80	9.19 807	82	0.80 193	9.99 466	2			
59	9.19 353	80	9.19 889	82	0.80 111	9.99 464	1			
60	9.19 433	80	9.19 971	80	0.80 029	9.99 462	0			
			L Cos	d	L Cot	c d	L Tan	L Sin		P P

L Sin							L Tan			cd		L Cot		L Cos		PP		
/	L Sin	d	L Tan	cd	L Cot	L Cos	60	82	81	80								
O	9.19 433	80	9.19 971	82	0.80 029	9.99 462	60											
1	9.19 513	79	9.20 053	81	0.79 947	9.99 460	59											
2	9.19 592	80	9.20 134	82	0.79 866	9.99 458	58											
3	9.19 672	79	9.20 216	81	0.79 784	9.99 456	57											
4	9.19 751	79	9.20 297	81	0.79 703	9.99 454	56											
5	9.19 830	79	9.20 378	81	0.79 622	9.99 452	55											
6	9.19 909	79	9.20 459	81	0.79 541	9.99 450	54											
7	9.19 988	79	9.20 540	81	0.79 460	9.99 448	53											
8	9.20 067	79	9.20 621	80	0.79 379	9.99 446	52											
9	9.20 145	78	9.20 701	81	0.79 299	9.99 444	51											
10	9.20 223	79	9.20 782	80	0.79 218	9.99 442	50											
11	9.20 302	78	9.20 862	80	0.79 138	9.99 440	49											
12	9.20 380	78	9.20 942	80	0.79 058	9.99 438	48											
13	9.20 458	78	9.21 022	80	0.78 978	9.99 436	47											
14	9.20 535	77	9.21 102	80	0.78 898	9.99 434	46											
15	9.20 613	78	9.21 182	80	0.78 818	9.99 432	45											
16	9.20 691	78	9.21 261	79	0.78 739	9.99 429	44											
17	9.20 768	77	9.21 341	80	0.78 659	9.99 427	43											
18	9.20 845	77	9.21 420	79	0.78 580	9.99 425	42											
19	9.20 922	77	9.21 499	79	0.78 501	9.99 423	41											
20	9.20 999	77	9.21 578	79	0.78 422	9.99 421	40											
21	9.21 076	77	9.21 657	79	0.78 343	9.99 419	39											
22	9.21 153	77	9.21 736	79	0.78 264	9.99 417	38											
23	9.21 229	76	9.21 814	78	0.78 186	9.99 415	37											
24	9.21 306	77	9.21 893	79	0.78 107	9.99 413	36											
25	9.21 382	76	9.21 971	78	0.78 029	9.99 411	35											
26	9.21 458	76	9.22 049	78	0.77 951	9.99 409	34											
27	9.21 534	76	9.22 127	78	0.77 873	9.99 407	33											
28	9.21 610	76	9.22 205	78	0.77 795	9.99 404	32											
29	9.21 685	75	9.22 283	78	0.77 717	9.99 402	31											
30	9.21 761	75	9.22 361	77	0.77 639	9.99 400	30											
31	9.21 836	76	9.22 438	78	0.77 562	9.99 398	29											
32	9.21 912	76	9.22 516	78	0.77 484	9.99 396	28											
33	9.21 987	75	9.22 593	77	0.77 407	9.99 394	27											
34	9.22 062	75	9.22 670	77	0.77 330	9.99 392	26											
35	9.22 137	75	9.22 747	77	0.77 253	9.99 390	25											
36	9.22 211	74	9.22 824	77	0.77 176	9.99 388	24											
37	9.22 286	75	9.22 901	76	0.77 099	9.99 385	23											
38	9.22 361	75	9.22 977	76	0.77 023	9.99 383	22											
39	9.22 435	74	9.23 054	77	0.76 946	9.99 381	21											
40	9.22 509	74	9.23 130	76	0.76 870	9.99 379	20											
41	9.22 583	74	9.23 206	77	0.76 794	9.99 377	19											
42	9.22 657	74	9.23 283	76	0.76 717	9.99 375	18											
43	9.22 731	74	9.23 359	76	0.76 641	9.99 372	17											
44	9.22 805	73	9.23 435	75	0.76 565	9.99 370	16											
45	9.22 878	73	9.23 510	75	0.76 490	9.99 368	15											
46	9.22 952	73	9.23 586	76	0.76 414	9.99 366	14											
47	9.23 025	73	9.23 661	76	0.76 339	9.99 364	13											
48	9.23 098	73	9.23 737	75	0.76 263	9.99 362	12											
49	9.23 171	73	9.23 812	75	0.76 188	9.99 359	11											
50	9.23 244	73	9.23 887	75	0.76 113	9.99 357	10											
51	9.23 317	73	9.23 962	75	0.76 038	9.99 355	9											
52	9.23 390	73	9.24 037	75	0.75 963	9.99 353	8											
53	9.23 462	72	9.24 112	75	0.75 888	9.99 351	7											
54	9.23 535	72	9.24 186	74	0.75 814	9.99 348	6											
55	9.23 607	72	9.24 261	75	0.75 739	9.99 346	5											
56	9.23 679	72	9.24 335	74	0.75 665	9.99 344	4											
57	9.23 752	71	9.24 410	74	0.75 590	9.99 342	3											
58	9.23 823	71	9.24 484	74	0.75 516	9.99 340	2											
59	9.23 895	72	9.24 558	74	0.75 442	9.99 337	1											
60	9.23 967		9.24 632		0.75 368	9.99 335	0											

I	L Sin	d	L Tan	c d	L Cot	L Cos	d	P P		
O	9.23 967	72	9.24 632	74	0.75 368	9.99 335	2	60		
1	9.24 039	71	9.24 706	73	0.75 294	9.99 333	2	59		
2	9.24 110	71	9.24 779	73	0.75 221	9.99 331	2	58		
3	9.24 181	71	9.24 853	73	0.75 147	9.99 328	3	57		
4	9.24 253	72	9.24 926	73	0.75 074	9.99 326	2	56		
5	9.24 324	71	9.25 000	74	0.75 000	9.99 324	2	55		
6	9.24 395	71	9.25 073	73	0.74 927	9.99 322	2	54		
7	9.24 466	71	9.25 146	73	0.74 854	9.99 319	3	53		
8	9.24 536	70	9.25 219	73	0.74 781	9.99 317	2	52		
9	9.24 607	71	9.25 292	73	0.74 708	9.99 315	2	51		
10	9.24 677	70	9.25 365	73	0.74 635	9.99 313	2	50		
11	9.24 748	71	9.25 437	72	0.74 563	9.99 310	3		49	
12	9.24 818	70	9.25 510	73	0.74 490	9.99 308	2		48	
13	9.24 888	70	9.25 582	72	0.74 418	9.99 306	2		47	
14	9.24 958	70	9.25 655	73	0.74 345	9.99 304	2		46	
15	9.25 028	70	9.25 727	72	0.74 273	9.99 301	3		45	
16	9.25 098	70	9.25 799	72	0.74 201	9.99 299	2		44	
17	9.25 168	70	9.25 871	72	0.74 129	9.99 297	2		43	
18	9.25 237	69	9.25 943	72	0.74 057	9.99 294	3		42	
19	9.25 307	70	9.26 015	72	0.73 985	9.99 292	2		41	
20	9.25 376	69	9.26 086	71	0.73 914	9.99 290	2		40	
21	9.25 445	69	9.26 158	72	0.73 842	9.99 288	2		39	
22	9.25 514	69	9.26 229	71	0.73 771	9.99 285	3		38	
23	9.25 583	69	9.26 301	72	0.73 699	9.99 283	2		37	
24	9.25 652	69	9.26 372	71	0.73 628	9.99 281	2		36	
25	9.25 721	69	9.26 443	71	0.73 557	9.99 278	3		35	
26	9.25 790	68	9.26 514	71	0.73 486	9.99 276	2		34	
27	9.25 858	69	9.26 585	70	0.73 415	9.99 274	3		33	
28	9.25 927	69	9.26 655	70	0.73 345	9.99 271	3		32	
29	9.25 995	68	9.26 726	71	0.73 274	9.99 269	2		31	
30	9.26 063	68	9.26 797	70	0.73 203	9.99 267	3		30	
31	9.26 131	68	9.26 867	70	0.73 133	9.99 264	2		29	
32	9.26 199	68	9.26 937	70	0.73 063	9.99 262	2		28	
33	9.26 267	68	9.27 008	71	0.72 992	9.99 260	2		27	
34	9.26 335	68	9.27 078	70	0.72 922	9.99 257	3		26	
35	9.26 403	68	9.27 148	70	0.72 852	9.99 255	2		25	
36	9.26 470	67	9.27 218	70	0.72 782	9.99 252	3		24	
37	9.26 538	67	9.27 288	70	0.72 712	9.99 250	2		23	
38	9.26 605	67	9.27 357	69	0.72 643	9.99 248	2		22	
39	9.26 672	67	9.27 427	70	0.72 573	9.99 245	3		21	
40	9.26 739	67	9.27 496	69	0.72 504	9.99 243	2		20	
41	9.26 806	67	9.27 566	70	0.72 434	9.99 241	2		19	
42	9.26 873	67	9.27 635	69	0.72 365	9.99 238	3		18	
43	9.26 940	67	9.27 704	69	0.72 296	9.99 236	2		17	
44	9.27 007	66	9.27 773	69	0.72 227	9.99 233	3		16	
45	9.27 073	66	9.27 842	69	0.72 158	9.99 231	2		15	
46	9.27 140	66	9.27 911	69	0.72 089	9.99 229	3		14	
47	9.27 206	67	9.27 980	69	0.72 020	9.99 226	2		13	
48	9.27 273	67	9.28 049	68	0.71 951	9.99 224	3		12	
49	9.27 339	66	9.28 117	69	0.71 883	9.99 221	2		11	
50	9.27 405	66	9.28 186	68	0.71 814	9.99 219	2		10	
51	9.27 471	66	9.28 254	69	0.71 746	9.99 217	3		9	
52	9.27 537	65	9.28 323	69	0.71 677	9.99 214	2		8	
53	9.27 602	66	9.28 391	68	0.71 609	9.99 212	3		7	
54	9.27 668	66	9.28 459	68	0.71 541	9.99 209	2		6	
55	9.27 734	66	9.28 527	68	0.71 473	9.99 207	3		5	
56	9.27 799	65	9.28 595	67	0.71 405	9.99 204	2		4	
57	9.27 864	66	9.28 662	68	0.71 338	9.99 202	2		3	
58	9.27 930	66	9.28 730	68	0.71 270	9.99 200	3		2	
59	9.27 995	65	9.28 798	67	0.71 202	9.99 197	2		1	
60	9.28 060		9.28 865		0.71 135	9.99 195			O	
	L Cos	d	L Cot	c d	L Tan	L Sin	d	I	P P	

	L Sin	d	L Tan	c d	L Cot	L Cos	d		P P
0	9.28 060	65	9.28 865	68	0.71 135	9.99 195	3	60	
1	9.28 125	65	9.28 933	67	0.71 067	9.99 192	2	59	
2	9.28 190	64	9.29 000	67	0.71 000	9.99 190	2	58	
3	9.28 254	65	9.29 067	67	0.70 933	9.99 187	3	57	
4	9.28 319	65	9.29 134	67	0.70 866	9.99 185	2	56	68 67 66
5	9.28 384	64	9.29 201	67	0.70 799	9.99 182	3	55	1 6.8 6.7 6.6
6	9.28 448	64	9.29 268	67	0.70 732	9.99 180	2	54	2 13.6 13.4 13.2
7	9.28 512	64	9.29 335	67	0.70 665	9.99 177	3	53	3 20.4 20.1 19.8
8	9.28 577	65	9.29 402	67	0.70 598	9.99 175	2	52	4 27.2 26.8 26.4
9	9.28 641	64	9.29 468	66	0.70 532	9.99 172	3	51	5 34.0 33.5 33.0
10	9.28 705	64	9.29 535	66	0.70 465	9.99 170	2	50	6 40.8 40.2 39.6
11	9.28 769	64	9.29 601	67	0.70 399	9.99 167	3	49	7 47.6 46.0 46.2
12	9.28 833	63	9.29 668	66	0.70 332	9.99 165	2	48	8 54.4 53.6 52.8
13	9.28 896	63	9.29 734	66	0.70 266	9.99 162	3	47	9 61.2 60.3 59.4
14	9.28 960	64	9.29 800	66	0.70 200	9.99 160	2	46	
15	9.29 024	64	9.29 866	66	0.70 134	9.99 157	3	45	
16	9.29 087	63	9.29 932	66	0.70 068	9.99 155	2	44	65 64 63
17	9.29 150	63	9.29 998	66	0.70 002	9.99 152	3	43	1 6.5 6.4 6.3
18	9.29 214	64	9.30 064	66	0.69 936	9.99 150	2	42	2 13.0 12.8 12.6
19	9.29 277	63	9.30 130	65	0.69 870	9.99 147	3	41	3 19.5 19.2 18.9
20	9.29 340	63	9.30 195	66	0.69 805	9.99 145	3	40	4 26.0 25.6 25.2
21	9.29 403	63	9.30 261	65	0.69 739	9.99 142	2	39	5 32.5 32.0 31.5
22	9.29 466	63	9.30 326	65	0.69 674	9.99 140	3	38	6 39.0 38.4 37.8
23	9.29 529	62	9.30 391	65	0.69 609	9.99 137	2	37	7 45.5 44.8 44.1
24	9.29 591	63	9.30 457	65	0.69 543	9.99 135	2	36	8 52.0 51.2 50.4
25	9.29 654	62	9.30 522	65	0.69 478	9.99 132	3	35	9 58.5 57.6 56.7
26	9.29 716	63	9.30 587	65	0.69 413	9.99 130	2	34	
27	9.29 779	62	9.30 652	65	0.69 348	9.99 127	3	33	62 61
28	9.29 841	62	9.30 717	65	0.69 283	9.99 124	3	32	1 6.2 6.1
29	9.29 903	63	9.30 782	64	0.69 218	9.99 122	3	31	2 12.4 12.2
30	9.29 966	62	9.30 846	65	0.69 154	9.99 119	2	30	3 18.6 18.3
31	9.30 028	62	9.30 911	64	0.69 089	9.99 117	3	29	4 24.8 24.4
32	9.30 090	61	9.30 975	65	0.69 025	9.99 114	2	28	5 31.0 30.5
33	9.30 151	62	9.31 040	64	0.68 960	9.99 112	3	27	6 37.2 36.6
34	9.30 213	62	9.31 104	64	0.68 896	9.99 109	3	26	7 43.4 42.7
35	9.30 275	61	9.31 168	64	0.68 832	9.99 106	3	25	8 49.6 48.8
36	9.30 336	62	9.31 233	65	0.68 767	9.99 104	2	24	9 55.8 54.9
37	9.30 398	61	9.31 297	64	0.68 703	9.99 101	3	23	
38	9.30 459	62	9.31 361	64	0.68 639	9.99 099	2	22	60 59
39	9.30 521	61	9.31 425	64	0.68 575	9.99 096	3	21	1 6.0 5.9
40	9.30 582	61	9.31 489	63	0.68 511	9.99 093	2	20	2 12.0 11.8
41	9.30 643	61	9.31 552	64	0.68 448	9.99 091	3	19	3 18.0 17.7
42	9.30 704	61	9.31 616	64	0.68 384	9.99 088	2	18	4 24.0 23.6
43	9.30 765	61	9.31 679	63	0.68 321	9.99 086	3	17	5 30.0 29.5
44	9.30 826	61	9.31 743	63	0.68 257	9.99 083	3	16	6 36.0 35.4
45	9.30 887	60	9.31 806	64	0.68 194	9.99 080	2	15	7 42.0 41.3
46	9.30 947	61	9.31 870	63	0.68 130	9.99 078	3	14	8 48.0 47.2
47	9.31 008	60	9.31 933	63	0.68 067	9.99 075	3	13	9 54.0 53.1
48	9.31 068	61	9.31 996	63	0.68 004	9.99 072	2	12	
49	9.31 129	60	9.32 059	63	0.67 941	9.99 070	3	11	3 2
50	9.31 189	61	9.32 122	63	0.67 878	9.99 067	3	10	1 0.3 0.2
51	9.31 250	60	9.32 185	63	0.67 815	9.99 064	2	9	2 0.6 0.4
52	9.31 310	60	9.32 248	63	0.67 752	9.99 062	3	8	3 0.0 0.6
53	9.31 370	60	9.32 311	62	0.67 689	9.99 059	3	7	4 1.2 0.8
54	9.31 430	60	9.32 373	63	0.67 627	9.99 056	2	6	5 1.5 1.0
55	9.31 490	59	9.32 436	62	0.67 564	9.99 054	3	5	6 1.8 1.2
56	9.31 549	60	9.32 498	63	0.67 502	9.99 051	3	4	7 2.1 1.4
57	9.31 609	60	9.32 561	62	0.67 439	9.99 048	2	3	8 2.4 1.6
58	9.31 669	59	9.32 623	62	0.67 377	9.99 046	3	2	9 2.7 1.8
59	9.31 728	60	9.32 685	62	0.67 315	9.99 043	3	1	
60	9.31 788		9.32 747		0.67 253	9.99 040		O	
	L Cos	d	L Cot	c d	L Tan	L Sin	d	I	P P

/	L Sin	d	L Tan	c d	L Cot	L Cos	d	P P			
0	9.31 788	59	9.32 747	63	0.67 253	9.99 040	2	60			
1	9.31 847	60	9.32 810	62	0.67 190	9.99 038	3	59			
2	9.31 907	59	9.32 872	61	0.67 128	9.99 035	3	58			
3	9.31 966	59	9.32 933	62	0.67 067	9.99 032	3	57			
4	9.32 025	59	9.32 995	62	0.67 005	9.99 030	2	56			
5	9.32 084	59	9.33 057	62	0.66 943	9.99 027	3	55	1	6.3 6.2 6.1	
6	9.32 143	59	9.33 119	61	0.66 881	9.99 024	3	54	2	12.6 12.4 12.2	
7	9.32 202	59	9.33 180	62	0.66 820	9.99 022	2	53	3	18.0 18.6 18.3	
8	9.32 261	59	9.33 242	61	0.66 758	9.99 019	3	52	4	25.2 24.8 24.4	
9	9.32 319	59	9.33 303	62	0.66 697	9.99 016	3	51	5	34.5 31.0 30.5	
10	9.32 378	59	9.33 365	61	0.66 635	9.99 013	2	50	6	37.3 37.2 36.6	
11	9.32 437	58	9.33 426	61	0.66 574	9.99 011	3	49	7	44.1 43.4 42.7	
12	9.32 495	58	9.33 487	61	0.66 513	9.99 008	3	48	8	50.4 49.6 48.8	
13	9.32 553	58	9.33 548	61	0.66 452	9.99 005	3	47	9	55.7 55.8 54.9	
14	9.32 612	59	9.33 609	61	0.66 391	9.99 002	2	46			
15	9.32 670	58	9.33 670	61	0.66 330	9.99 000	2	45	1	6.0 5.9 5.8	
16	9.32 728	58	9.33 731	61	0.66 269	9.98 997	3	44	2	12.0 11.8 11.7	
17	9.32 786	58	9.33 792	61	0.66 208	9.98 994	3	43	3	18.0 17.7 17.6	
18	9.32 844	58	9.33 853	60	0.66 147	9.98 991	2	42	4	24.0 23.6 23.5	
19	9.32 902	58	9.33 913	61	0.66 087	9.98 989	3	41	5	30.0 29.5 29.4	
20	9.32 960	58	9.33 974	60	0.66 026	9.98 986	3	40	6	36.0 35.4 35.3	
21	9.33 018	57	9.34 034	61	0.65 966	9.98 983	3	39	7	42.0 41.3 41.2	
22	9.33 075	57	9.34 095	60	0.65 905	9.98 980	3	38	8	48.0 47.2 47.1	
23	9.33 133	58	9.34 155	60	0.65 845	9.98 978	2	37	9	54.0 53.1 53.0	
24	9.33 190	57	9.34 215	61	0.65 785	9.98 975	3	36			
25	9.33 248	58	9.34 276	61	0.65 724	9.98 972	3	35			
26	9.33 305	57	9.34 336	60	0.65 664	9.98 969	3	34			
27	9.33 362	58	9.34 396	60	0.65 604	9.98 967	3	33			
28	9.33 420	57	9.34 456	60	0.65 544	9.98 964	3	32	1	5.8 5.7 5.6	
29	9.33 477	57	9.34 516	60	0.65 484	9.98 961	3	31	2	11.6 11.4 11.3	
30	9.33 534	57	9.34 576	59	0.65 424	9.98 958	3	30	3	17.4 17.2 17.1	
31	9.33 591	56	9.34 635	60	0.65 365	9.98 955	2	29	4	23.2 22.8 22.7	
32	9.33 647	56	9.34 695	60	0.65 305	9.98 953	2	28	5	29.0 28.5 28.4	
33	9.33 704	57	9.34 755	59	0.65 245	9.98 950	3	27	6	34.8 34.2 34.1	
34	9.33 761	57	9.34 814	60	0.65 186	9.98 947	3	26	7	40.6 39.9 39.8	
35	9.33 818	56	9.34 874	59	0.65 126	9.98 944	3	25	8	46.4 45.6 45.5	
36	9.33 874	57	9.34 933	59	0.65 067	9.98 941	3	24	9	52.2 51.3 51.2	
37	9.33 931	56	9.34 992	59	0.65 008	9.98 938	2	23			
38	9.33 987	56	9.35 051	60	0.64 949	9.98 936	2	22			
39	9.34 043	57	9.35 111	59	0.64 889	9.98 933	3	21	1	5.6 5.5 5.5	
40	9.34 100	56	9.35 170	59	0.64 830	9.98 930	3	20	2	11.2 11.0 10.9	
41	9.34 156	56	9.35 229	59	0.64 771	9.98 927	3	19	3	16.8 16.5 16.3	
42	9.34 212	56	9.35 288	59	0.64 712	9.98 924	3	18	4	22.4 22.0 21.8	
43	9.34 268	56	9.35 347	58	0.64 653	9.98 921	2	17	5	28.0 27.5 27.3	
44	9.34 324	56	9.35 405	59	0.64 595	9.98 919	3	16	6	33.6 33.0 32.9	
45	9.34 380	56	9.35 464	59	0.64 536	9.98 916	3	15	7	39.2 38.5 38.4	
46	9.34 436	55	9.35 523	58	0.64 477	9.98 913	3	14	8	44.8 44.0 43.9	
47	9.34 491	56	9.35 581	59	0.64 419	9.98 910	3	13	9	50.4 49.5 49.4	
48	9.34 547	55	9.35 640	58	0.64 360	9.98 907	3	12			
49	9.34 602	56	9.35 698	59	0.64 302	9.98 904	3	11			
50	9.34 658	55	9.35 757	58	0.64 243	9.98 901	3	10	1	5.2 5.1 5.0	
51	9.34 713	56	9.35 815	58	0.64 185	9.98 898	2	9	2	0.6 0.5 0.4	
52	9.34 769	55	9.35 873	58	0.64 127	9.98 896	3	8	3	0.9 0.8 0.7	
53	9.34 824	55	9.35 931	58	0.64 069	9.98 893	3	7	4	1.2 1.1 1.0	
54	9.34 879	55	9.35 989	58	0.64 011	9.98 890	3	6	5	1.5 1.4 1.3	
55	9.34 934	55	9.36 047	58	0.63 953	9.98 887	3	5	6	1.8 1.7 1.6	
56	9.34 989	55	9.36 105	58	0.63 895	9.98 884	3	4	7	2.1 2.0 1.9	
57	9.35 044	55	9.36 163	58	0.63 837	9.98 881	3	3	8	2.4 2.3 2.2	
58	9.35 099	55	9.36 221	58	0.63 779	9.98 878	3	2	9	2.7 2.6 2.5	
59	9.35 154	55	9.36 279	57	0.63 721	9.98 875	3	1			
60	9.35 209		9.36 336		0.63 664	9.98 872		O			
	L Cos	d	L Cot	c d	L Tan	L Sin	d	/	P P		

/	L Sin	d	L Tan	c d	L Cot	L Cos	d		P P
0	9.35 209	54	9.36 336	58	0.63 664	9.98 872	3	60	
1	9.35 263	55	9.36 394	58	0.63 606	9.98 869	2	59	
2	9.35 318	55	9.36 452	58	0.63 548	9.98 867	3	58	
3	9.35 373	54	9.36 509	57	0.63 491	9.98 864	3	57	
4	9.35 427	54	9.36 566	57	0.63 434	9.98 861	3	56	
5	9.35 481	54	9.36 624	58	0.63 376	9.98 858	3	55	
6	9.35 536	55	9.36 681	57	0.63 319	9.98 855	3	54	
7	9.35 590	54	9.36 738	57	0.63 262	9.98 852	3	53	
8	9.35 644	54	9.36 795	57	0.63 205	9.98 849	3	52	
9	9.35 698	54	9.36 852	57	0.63 148	9.98 846	3	51	
10	9.35 752	54	9.36 909	57	0.63 091	9.98 843	3	50	
11	9.35 806	54	9.36 966	57	0.63 034	9.98 840	3	49	
12	9.35 860	54	9.37 023	57	0.62 977	9.98 837	3	48	
13	9.35 914	54	9.37 080	57	0.62 920	9.98 834	3	47	
14	9.35 968	54	9.37 137	56	0.62 863	9.98 831	3	46	
15	9.36 022	54	9.37 193	56	0.62 807	9.98 828	3	45	
16	9.36 075	53	9.37 250	57	0.62 750	9.98 825	3	44	
17	9.36 129	54	9.37 306	56	0.62 694	9.98 822	3	43	
18	9.36 182	53	9.37 363	57	0.62 637	9.98 819	3	42	
19	9.36 236	54	9.37 419	56	0.62 581	9.98 816	3	41	
20	9.36 289	53	9.37 476	56	0.62 524	9.98 813	3	40	
21	9.36 342	53	9.37 532	56	0.62 468	9.98 810	3	39	
22	9.36 395	53	9.37 588	56	0.62 412	9.98 807	3	38	
23	9.36 449	53	9.37 644	56	0.62 356	9.98 804	3	37	
24	9.36 502	53	9.37 700	56	0.62 300	9.98 801	3	36	
25	9.36 555	53	9.37 756	56	0.62 244	9.98 798	3	35	
26	9.36 608	53	9.37 812	56	0.62 188	9.98 795	3	34	
27	9.36 660	52	9.37 868	56	0.62 132	9.98 792	3	33	
28	9.36 713	53	9.37 924	56	0.62 076	9.98 789	3	32	
29	9.36 766	53	9.37 980	56	0.62 020	9.98 786	3	31	
30	9.36 819	52	9.38 035	56	0.61 965	9.98 783	3	30	
31	9.36 871	52	9.38 091	56	0.61 909	9.98 780	3	29	
32	9.36 924	53	9.38 147	56	0.61 853	9.98 777	3	28	
33	9.36 976	52	9.38 202	55	0.61 798	9.98 774	3	27	
34	9.37 028	52	9.38 257	56	0.61 743	9.98 771	3	26	
35	9.37 081	53	9.38 313	56	0.61 687	9.98 768	3	25	
36	9.37 133	52	9.38 368	55	0.61 632	9.98 765	3	24	
37	9.37 185	52	9.38 423	55	0.61 577	9.98 762	3	23	
38	9.37 237	52	9.38 479	56	0.61 521	9.98 759	3	22	
39	9.37 289	52	9.38 534	55	0.61 466	9.98 756	3	21	
40	9.37 341	52	9.38 589	55	0.61 411	9.98 753	3	20	
41	9.37 393	52	9.38 644	55	0.61 356	9.98 750	4	19	
42	9.37 445	52	9.38 699	55	0.61 301	9.98 746	4	18	
43	9.37 497	52	9.38 754	55	0.61 246	9.98 743	3	17	
44	9.37 549	51	9.38 808	56	0.61 192	9.98 740	3	16	
45	9.37 600	52	9.38 863	55	0.61 137	9.98 737	3	15	
46	9.37 652	52	9.38 918	55	0.61 082	9.98 734	3	14	
47	9.37 703	51	9.38 972	54	0.61 028	9.98 731	3	13	
48	9.37 755	52	9.39 027	55	0.60 973	9.98 728	3	12	
49	9.37 806	51	9.39 082	55	0.60 918	9.98 725	3	11	
50	9.37 858	52	9.39 136	54	0.60 864	9.98 722	3	10	
51	9.37 909	51	9.39 190	55	0.60 810	9.98 719	4	9	
52	9.37 960	51	9.39 245	55	0.60 755	9.98 715	4	8	
53	9.38 011	51	9.39 299	54	0.60 701	9.98 712	3	7	
54	9.38 062	51	9.39 353	54	0.60 647	9.98 709	3	6	
55	9.38 113	51	9.39 407	54	0.60 593	9.98 706	3	5	
56	9.38 164	51	9.39 461	54	0.60 539	9.98 703	3	4	
57	9.38 215	51	9.39 515	54	0.60 485	9.98 700	3	3	
58	9.38 266	51	9.39 569	54	0.60 431	9.98 697	3	2	
59	9.38 317	51	9.39 623	54	0.60 377	9.98 694	3	1	
60	9.38 368	51	9.39 677	54	0.60 323	9.98 690	4	0	
	L Cos	P	L Cot	c d	L Tan	L Sin	d		P P

/	L Sin	d	L Tan	c d	L Cot	L Cos	d		P P
0	9.38 368	50	9.39 677	54	0.60 323	9.98 690	3	60	
1	9.38 418	50	9.39 731	54	0.60 269	9.98 687	3	59	
2	9.38 469	51	9.39 785	54	0.60 215	9.98 684	3	58	
3	9.38 519	50	9.39 838	53	0.60 162	9.98 681	3	57	
4	9.38 570	51	9.39 892	54	0.60 108	9.98 678	3	56	
5	9.38 620	50	9.39 945	53	0.60 055	9.98 675	3	55	
6	9.38 670	50	9.39 999	54	0.60 001	9.98 671	4	54	
7	9.38 721	51	9.40 052	53	0.59 948	9.98 668	3	53	
8	9.38 771	50	9.40 106	54	0.59 894	9.98 665	3	52	
9	9.38 821	50	9.40 159	53	0.59 841	9.98 662	3	51	
10	9.38 871	50	9.40 212	54	0.59 788	9.98 659	3	50	
11	9.38 921	50	9.40 266	54	0.59 734	9.98 656	3	49	
12	9.38 971	50	9.40 319	53	0.59 681	9.98 652	4	48	
13	9.39 021	50	9.40 372	53	0.59 628	9.98 649	3	47	
14	9.39 071	50	9.40 425	53	0.59 575	9.98 646	3	46	
15	9.39 121	50	9.40 478	53	0.59 522	9.98 643	3	45	
16	9.39 170	49	9.40 531	53	0.59 469	9.98 640	3	44	
17	9.39 220	50	9.40 584	52	0.59 416	9.98 636	4	43	
18	9.39 270	50	9.40 636	52	0.59 364	9.98 633	3	42	
19	9.39 319	49	9.40 689	53	0.59 311	9.98 630	3	41	
20	9.39 369	50	9.40 742	53	0.59 258	9.98 627	3	40	
21	9.39 418	49	9.40 795	52	0.59 205	9.98 623	4	39	
22	9.39 467	49	9.40 847	52	0.59 153	9.98 620	3	38	
23	9.39 517	50	9.40 900	53	0.59 100	9.98 617	3	37	
24	9.39 566	49	9.40 952	52	0.59 048	9.98 614	3	36	
25	9.39 615	49	9.41 005	53	0.58 995	9.98 610	4	35	
26	9.39 664	49	9.41 057	52	0.58 943	9.98 607	3	34	
27	9.39 713	49	9.41 109	52	0.58 891	9.98 604	3	33	
28	9.39 762	49	9.41 161	52	0.58 839	9.98 601	4	32	
29	9.39 811	49	9.41 214	53	0.58 786	9.98 597	3	31	
30	9.39 860	49	9.41 266	52	0.58 734	9.98 594	3	30	
31	9.39 909	49	9.41 318	52	0.58 682	9.98 591	3	29	
32	9.39 958	49	9.41 370	52	0.58 630	9.98 588	3	28	
33	9.40 006	48	9.41 422	52	0.58 578	9.98 584	4	27	
34	9.40 055	49	9.41 474	52	0.58 526	9.98 581	3	26	
35	9.40 103	48	9.41 526	52	0.58 474	9.98 578	3	25	
36	9.40 152	49	9.41 578	52	0.58 422	9.98 574	3	24	
37	9.40 200	49	9.41 629	52	0.58 371	9.98 571	3	23	
38	9.40 249	48	9.41 681	52	0.58 319	9.98 568	3	22	
39	9.40 297	49	9.41 733	51	0.58 267	9.98 565	3	21	
40	9.40 346	48	9.41 784	52	0.58 216	9.98 561	4	20	
41	9.40 394	48	9.41 836	51	0.58 164	9.98 558	3	19	
42	9.40 442	48	9.41 887	52	0.58 113	9.98 555	4	18	
43	9.40 490	48	9.41 939	51	0.58 061	9.98 551	3	17	
44	9.40 538	48	9.41 990	51	0.58 010	9.98 548	3	16	
45	9.40 586	48	9.42 041	51	0.57 959	9.98 545	3	15	
46	9.40 634	48	9.42 093	51	0.57 907	9.98 541	3	14	
47	9.40 682	48	9.42 144	51	0.57 856	9.98 538	3	13	
48	9.40 730	48	9.42 195	51	0.57 805	9.98 535	4	12	
49	9.40 778	47	9.42 246	51	0.57 754	9.98 531	3	11	
50	9.40 825	48	9.42 297	51	0.57 703	9.98 528	3	10	
51	9.40 873	48	9.42 348	51	0.57 652	9.98 525	3	9	
52	9.40 921	47	9.42 399	51	0.57 601	9.98 521	4	8	
53	9.40 968	48	9.42 450	51	0.57 550	9.98 518	3	7	
54	9.41 016	47	9.42 501	51	0.57 499	9.98 515	4	6	
55	9.41 063	48	9.42 552	51	0.57 448	9.98 511	4	5	
56	9.41 111	47	9.42 603	50	0.57 397	9.98 508	3	4	
57	9.41 158	47	9.42 653	51	0.57 347	9.98 505	4	3	
58	9.41 205	47	9.42 704	51	0.57 296	9.98 501	3	2	
59	9.41 252	48	9.42 755	50	0.57 245	9.98 498	4	1	
60	9.41 300		9.42 805	50	0.57 195	9.98 494		0	
	L Cos	d	L Cot	c d	L Tan	L Sin	d	/	P P

/	L Sin	d	L Tan	cd	L Cot	L Cos	d		P P	
0	9.41 300	47	9.42 805	51	0.57 195	9.98 494	3	60		
1	9.41 347	47	9.42 856	50	0.57 144	9.98 491	3	59		
2	9.41 394	47	9.42 906	50	0.57 094	9.98 488	3	58		
3	9.41 441	47	9.42 957	51	0.57 043	9.98 484	4	57		
4	9.41 488	47	9.43 007	50	0.56 993	9.98 481	4	56		
5	9.41 535	47	9.43 057	50	0.56 943	9.98 477	4	55		
6	9.41 582	47	9.43 108	51	0.56 892	9.98 474	3	54		
7	9.41 628	46	9.43 158	50	0.56 842	9.98 471	3	53		
8	9.41 675	47	9.43 208	50	0.56 792	9.98 467	4	52		
9	9.41 722	47	9.43 258	50	0.56 742	9.98 464	3	51		
10	9.41 768	46	9.43 308	50	0.56 692	9.98 460	4	50		
11	9.41 815	46	9.43 358	50	0.56 642	9.98 457	3	49		
12	9.41 861	46	9.43 408	50	0.56 592	9.98 453	4	48		
13	9.41 908	47	9.43 458	50	0.56 542	9.98 450	3	47		
14	9.41 954	40	9.43 508	50	0.56 492	9.98 447	4	46		
15	9.42 001	47	9.43 558	50	0.56 442	9.98 443	4	45		
16	9.42 047	46	9.43 607	49	0.56 393	9.98 440	3	44		
17	9.42 093	46	9.43 657	50	0.56 343	9.98 436	4	43		
18	9.42 140	47	9.43 707	50	0.56 293	9.98 433	3	42		
19	9.42 186	46	9.43 756	49	0.56 244	9.98 429	4	41		
20	9.42 232	46	9.43 806	49	0.56 194	9.98 426	4	40		
21	9.42 278	46	9.43 855	50	0.56 145	9.98 422	3	39		
22	9.42 324	46	9.43 905	50	0.56 095	9.98 419	3	38		
23	9.42 370	46	9.43 954	50	0.56 046	9.98 415	4	37		
24	9.42 416	45	9.44 004	49	0.55 996	9.98 412	3	36		
25	9.42 461	45	9.44 053	49	0.55 947	9.98 409	3	35		
26	9.42 507	46	9.44 102	49	0.55 898	9.98 405	4	34		
27	9.42 553	46	9.44 151	50	0.55 849	9.98 402	3	33		
28	9.42 599	46	9.44 201	50	0.55 799	9.98 398	4	32		
29	9.42 644	45	9.44 250	49	0.55 750	9.98 395	4	31		
30	9.42 690	45	9.44 299	49	0.55 701	9.98 391	3	30		
31	9.42 735	46	9.44 348	49	0.55 652	9.98 388	4	29		
32	9.42 781	45	9.44 397	49	0.55 603	9.98 384	3	28		
33	9.42 826	45	9.44 446	49	0.55 554	9.98 381	4	27		
34	9.42 872	45	9.44 495	49	0.55 505	9.98 377	4	26		
35	9.42 917	45	9.44 544	49	0.55 456	9.98 373	4	25		
36	9.42 962	46	9.44 592	49	0.55 408	9.98 370	3	24		
37	9.43 008	45	9.44 641	49	0.55 359	9.98 366	3	23		
38	9.43 053	45	9.44 690	49	0.55 310	9.98 363	3	22		
39	9.43 098	45	9.44 738	48	0.55 262	9.98 359	4	21		
40	9.43 143	45	9.44 787	49	0.55 213	9.98 356	4	20		
41	9.43 188	45	9.44 836	48	0.55 164	9.98 352	3	19		
42	9.43 233	45	9.44 884	48	0.55 116	9.98 349	3	18		
43	9.43 278	45	9.44 933	48	0.55 067	9.98 345	4	17		
44	9.43 323	45	9.44 981	48	0.55 019	9.98 342	3	16		
45	9.43 367	44	9.45 029	48	0.54 971	9.98 338	4	15		
46	9.43 412	45	9.45 078	48	0.54 922	9.98 334	3	14		
47	9.43 457	45	9.45 126	48	0.54 874	9.98 331	4	13		
48	9.43 502	45	9.45 174	48	0.54 826	9.98 327	3	12		
49	9.43 546	44	9.45 222	48	0.54 778	9.98 324	4	11		
50	9.43 591	44	9.45 271	48	0.54 729	9.98 320	3	10		
51	9.43 635	45	9.45 319	48	0.54 681	9.98 317	4	9		
52	9.43 680	44	9.45 367	48	0.54 633	9.98 313	4	8		
53	9.43 724	45	9.45 415	48	0.54 585	9.98 309	3	7		
54	9.43 769	44	9.45 463	48	0.54 537	9.98 306	4	6		
55	9.43 813	44	9.45 511	48	0.54 489	9.98 302	4	5		
56	9.43 857	44	9.45 559	47	0.54 441	9.98 299	4	4		
57	9.43 901	45	9.45 606	48	0.54 394	9.98 295	4	3		
58	9.43 946	44	9.45 654	48	0.54 346	9.98 291	3	2		
59	9.43 990	44	9.45 702	48	0.54 298	9.98 288	4	1		
60	9.44 034		9.45 750		0.54 250	9.98 284		0		
	L Cos	d	L Cot	cd	L Tan	L Sin	d	/	P P	

/	L Sin	d	L Tan	c d	L Cot	L Cos	d		P P
O	9.44 034		9.45 750	47	0.54 250	9.98 284	3	60	
1	9.44 078	44	9.45 797	47	0.54 203	9.98 281	4	59	
2	9.44 122	44	9.45 845	48	0.54 155	9.98 277	4	58	
3	9.44 166	44	9.45 892	47	0.54 108	9.98 273	4	57	
4	9.44 210	44	9.45 940	47	0.54 060	9.98 270	3	56	
5	9.44 253	43	9.45 987	47	0.54 013	9.98 266	4	55	
6	9.44 297	44	9.46 035	48	0.53 965	9.98 262	4	54	
7	9.44 341	44	9.46 082	47	0.53 918	9.98 259	3	53	
8	9.44 385	44	9.46 130	48	0.53 870	9.98 255	4	52	
9	9.44 428	43	9.46 177	47	0.53 823	9.98 251	4	51	
10	9.44 472	44	9.46 224	47	0.53 776	9.98 248	3	50	
11	9.44 516	44	9.46 271	47	0.53 729	9.98 244	4	49	
12	9.44 559	43	9.46 319	48	0.53 681	9.98 240	4	48	
13	9.44 602	43	9.46 366	47	0.53 634	9.98 237	3	47	
14	9.44 646	44	9.46 413	47	0.53 587	9.98 233	4	46	
15	9.44 689	43	9.46 460	47	0.53 540	9.98 229	4	45	
16	9.44 733	44	9.46 507	47	0.53 493	9.98 226	3	44	
17	9.44 776	43	9.46 554	47	0.53 446	9.98 222	4	43	
18	9.44 819	43	9.46 601	47	0.53 399	9.98 218	4	42	
19	9.44 862	43	9.46 648	47	0.53 352	9.98 215	3	41	
20	9.44 905		9.46 694	46	0.53 306	9.98 211	4	40	
21	9.44 948	43	9.46 741	47	0.53 259	9.98 207	4	39	
22	9.44 992	44	9.46 788	47	0.53 212	9.98 204	3	38	
23	9.45 035	43	9.46 835	46	0.53 165	9.98 200	4	37	
24	9.45 077		9.46 881	46	0.53 119	9.98 196	4	36	
25	9.45 120	43	9.46 928	47	0.53 072	9.98 192	4	35	
26	9.45 163	43	9.46 975	47	0.53 025	9.98 189	3	34	
27	9.45 206	43	9.47 021	47	0.52 979	9.98 185	4	33	
28	9.45 249	43	9.47 068	46	0.52 932	9.98 181	4	32	
29	9.45 292	43	9.47 114	46	0.52 886	9.98 177	3	31	
30	9.45 334	43	9.47 160	47	0.52 840	9.98 174	4	30	
31	9.45 377		9.47 207	46	0.52 793	9.98 170	4	29	
32	9.45 419	42	9.47 253	46	0.52 747	9.98 166	4	28	
33	9.45 462	43	9.47 299	47	0.52 701	9.98 162	4	27	
34	9.45 504		9.47 346	46	0.52 654	9.98 159	4	26	
35	9.45 547	43	9.47 392	46	0.52 608	9.98 155	4	25	
36	9.45 589	42	9.47 438	46	0.52 562	9.98 151	4	24	
37	9.45 632	43	9.47 484	46	0.52 516	9.98 147	3	23	
38	9.45 674	42	9.47 530	46	0.52 470	9.98 144	2	22	
39	9.45 716	42	9.47 576	46	0.52 424	9.98 140	4	21	
40	9.45 758	43	9.47 622	46	0.52 378	9.98 136	4	20	
41	9.45 801		9.47 668	46	0.52 332	9.98 132	3	19	
42	9.45 843	42	9.47 714	46	0.52 286	9.98 129	3	18	
43	9.45 885	42	9.47 760	46	0.52 240	9.98 125	4	17	
44	9.45 927		9.47 806	46	0.52 194	9.98 121	4	16	
45	9.45 969	42	9.47 852	46	0.52 148	9.98 117	4	15	
46	9.46 011	42	9.47 897	45	0.52 103	9.98 113	3	14	
47	9.46 053		9.47 943	46	0.52 057	9.98 110	4	13	
48	9.46 095	42	9.47 989	46	0.52 011	9.98 106	4	12	
49	9.46 136	41	9.48 035	45	0.51 965	9.98 102	4	11	
50	9.46 178	42	9.48 080	46	0.51 920	9.98 098	4	10	
51	9.46 220		9.48 126	45	0.51 874	9.98 094	4	9	
52	9.46 262	42	9.48 171	45	0.51 829	9.98 090	3	8	
53	9.46 303	41	9.48 217	45	0.51 783	9.98 087	4	7	
54	9.46 345		9.48 262	45	0.51 738	9.98 083	4	6	
55	9.46 386	41	9.48 307	45	0.51 693	9.98 079	4	5	
56	9.46 428	42	9.48 353	46	0.51 647	9.98 075	4	4	
57	9.46 469		9.48 398	45	0.51 602	9.98 071	4	3	
58	9.46 511	42	9.48 443	46	0.51 557	9.98 067	4	2	
59	9.46 552	41	9.48 489	45	0.51 511	9.98 063	3	1	
60	9.46 594		9.48 534	45	0.51 466	9.98 060		0	
	L Cos	d	L Cot	c d	L Tan	L Sin	d	/	P P

/	L Sin	d	L Tan	c d	L Cot	L Cos	d	P P			
O	9.46 594	41	9.48 534	45	0.51 466	9.98 060	4	60			
1	9.46 635	41	9.48 579	45	0.51 421	9.98 056	4	59			
2	9.46 676	41	9.48 624	45	0.51 376	9.98 052	4	58			
3	9.46 717	41	9.48 669	45	0.51 331	9.98 048	4	57			
4	9.46 758	41	9.48 714	45	0.51 286	9.98 044	4	56			
5	9.46 800	42	9.48 759	45	0.51 241	9.98 040	4	55			
6	9.46 841	41	9.48 804	45	0.51 196	9.98 036	4	54			
7	9.46 882	41	9.48 849	45	0.51 151	9.98 032	4	53			
8	9.46 923	41	9.48 894	45	0.51 106	9.98 029	3	52	1	4.5	
9	9.46 964	41	9.48 939	45	0.51 061	9.98 025	4	51	2	9.0	
10	9.47 005	40	9.48 984	45	0.51 016	9.98 021	4	50	3	13.5	
									4	18.0	
11	9.47 045	40	9.49 029	44	0.50 971	9.98 017	4	49	5	22.5	
									6	27.0	
12	9.47 086	41	9.49 073	45	0.50 927	9.98 013	4	48	7	31.5	
13	9.47 127	41	9.49 118	45	0.50 882	9.98 009	4	47	8	36.0	
14	9.47 168	41	9.49 163	45	0.50 837	9.98 005	4	46	9	40.5	
15	9.47 209	41	9.49 207	44	0.50 793	9.98 001	4	45			
16	9.47 249	41	9.49 252	45	0.50 748	9.97 997	4	44			
17	9.47 290	40	9.49 296	44	0.50 704	9.97 993	4	43			
18	9.47 330	40	9.49 341	45	0.50 659	9.97 989	4	42			
19	9.47 371	40	9.49 385	44	0.50 615	9.97 986	3	41			
20	9.47 411	41	9.49 430	45	0.50 570	9.97 982	4	40			
21	9.47 452	40	9.49 474	44	0.50 526	9.97 978	4	39	1	4.2	
22	9.47 492	40	9.49 519	45	0.50 481	9.97 974	4	38	2	8.4	
23	9.47 533	40	9.49 563	44	0.50 437	9.97 970	4	37	3	12.6	
24	9.47 573	40	9.49 607	44	0.50 393	9.97 966	4	36	4	16.8	
25	9.47 613	40	9.49 652	45	0.50 348	9.97 962	4	35	5	21.0	
26	9.47 654	40	9.49 696	44	0.50 304	9.97 958	4	34	6	25.2	
27	9.47 694	40	9.49 740	44	0.50 260	9.97 954	4	33	7	29.4	
28	9.47 734	40	9.49 784	44	0.50 216	9.97 950	4	32	8	33.6	
29	9.47 774	40	9.49 828	44	0.50 172	9.97 946	4	31	9	37.8	
30	9.47 814	40	9.49 872	44	0.50 128	9.97 942	4	30			
31	9.47 854	40	9.49 916	44	0.50 084	9.97 938	4	29			
32	9.47 894	40	9.49 960	44	0.50 040	9.97 934	4	28			
33	9.47 934	40	9.50 004	44	0.49 996	9.97 930	4	27			
34	9.47 974	40	9.50 048	44	0.49 952	9.97 926	4	26	1	4.0	
35	9.48 014	40	9.50 092	44	0.49 908	9.97 922	4	25	2	8.0	
36	9.48 054	40	9.50 136	44	0.49 864	9.97 918	4	24	3	12.0	
37	9.48 094	39	9.50 180	44	0.49 820	9.97 914	4	23	4	16.0	
38	9.48 133	40	9.50 223	43	0.49 777	9.97 910	4	22	5	20.0	
39	9.48 173	40	9.50 267	44	0.49 733	9.97 906	4	21	6	24.0	
40	9.48 213	39	9.50 311	44	0.49 689	9.97 902	4	20	7	28.0	
41	9.48 252	40	9.50 355	43	0.49 645	9.97 898	4	19	8	32.0	
42	9.48 292	40	9.50 398	43	0.49 602	9.97 894	4	18	9	36.0	
43	9.48 332	40	9.50 442	44	0.49 558	9.97 890	4	17			
44	9.48 371	40	9.50 485	44	0.49 515	9.97 886	4	16			
45	9.48 411	39	9.50 529	44	0.49 471	9.97 882	4	15			
46	9.48 450	40	9.50 572	43	0.49 428	9.97 878	4	14			
47	9.48 490	39	9.50 616	44	0.49 384	9.97 874	4	13			
48	9.48 529	39	9.50 659	43	0.49 341	9.97 870	4	12	1	0.5	
49	9.48 568	39	9.50 703	44	0.49 297	9.97 866	5	11	2	0.8	
50	9.48 607	40	9.50 746	43	0.49 254	9.97 861	4	10	3	0.6	
51	9.48 647	39	9.50 789	44	0.49 211	9.97 857	4	9	4	1.2	
52	9.48 686	39	9.50 833	43	0.49 167	9.97 853	4	8	5	1.5	
53	9.48 725	39	9.50 876	43	0.49 124	9.97 849	4	7	6	2.0	
54	9.48 764	39	9.50 919	43	0.49 081	9.97 845	4	6	7	2.4	
55	9.48 803	39	9.50 962	43	0.49 038	9.97 841	4	5	8	2.8	
56	9.48 842	39	9.51 005	43	0.48 995	9.97 837	4	4	9	3.1	
57	9.48 881	39	9.51 048	44	0.48 952	9.97 833	4	3			
58	9.48 920	39	9.51 092	43	0.48 908	9.97 829	4	2			
59	9.48 959	39	9.51 135	43	0.48 865	9.97 825	4	1			
60	9.48 998		9.51 178	43	0.48 822	9.97 821		0			
	L Cos	d	L Cot	c d	L Tan	L Sin	d	/	P P		

I	L Sin	d	L Tan	cd	L Cot	L Cos	d		P P		
0	9.48 998	39	9.51 178	43	0.48 822	9.97 821	4	60			
1	9.49 037	39	9.51 221	43	0.48 779	9.97 817	4	59			
2	9.49 070	39	9.51 264	43	0.48 736	9.97 812	5	58			
3	9.49 115	39	9.51 306	42	0.48 694	9.97 808	4	57			
4	9.49 153	38	9.51 349	43	0.48 651	9.97 804	4	56			
5	9.49 192	39	9.51 392	43	0.48 608	9.97 800	4	55			
6	9.49 231	39	9.51 435	43	0.48 565	9.97 796	4	54		43	42
7	9.49 269	38	9.51 478	43	0.48 522	9.97 792	4	53	1	4.3	4.2
8	9.49 308	39	9.51 520	42	0.48 480	9.97 788	4	52	2	8.6	8.4
9	9.49 347	39	9.51 563	43	0.48 437	9.97 784	4	51	3	12.9	12.6
10	9.49 385	38	9.51 606	43	0.48 394	9.97 779	5	50	4	17.2	16.8
11	9.49 424	39	9.51 648	42	0.48 352	9.97 775	4	49	5	21.5	21.0
12	9.49 462	38	9.51 691	43	0.48 309	9.97 771	4	48	6	25.8	25.2
13	9.49 500	38	9.51 734	43	0.48 266	9.97 767	4	47	7	30.1	29.4
14	9.49 539	38	9.51 776	43	0.48 224	9.97 763	4	46	8	34.4	33.6
15	9.49 577	38	9.51 819	43	0.48 181	9.97 759	4	45	9	38.7	37.8
16	9.49 615	38	9.51 861	42	0.48 139	9.97 754	5	44			
17	9.49 654	39	9.51 903	42	0.48 097	9.97 750	4	43			
18	9.49 692	38	9.51 946	43	0.48 054	9.97 746	4	42			
19	9.49 730	38	9.51 988	42	0.48 012	9.97 742	4	41			
20	9.49 768	38	9.52 031	42	0.47 969	9.97 738	4	40		39	38
21	9.49 806	38	9.52 073	42	0.47 927	9.97 734	4	39	1	3.9	3.8
22	9.49 844	38	9.52 115	42	0.47 885	9.97 729	5	38	2	7.8	7.6
23	9.49 882	38	9.52 157	42	0.47 843	9.97 725	4	37	3	11.7	11.4
24	9.49 920	38	9.52 200	43	0.47 800	9.97 721	4	36	4	15.6	15.2
25	9.49 958	38	9.52 242	42	0.47 758	9.97 717	4	35	5	19.5	19.0
26	9.49 996	38	9.52 284	42	0.47 716	9.97 713	4	34	6	23.4	22.8
27	9.50 034	38	9.52 326	42	0.47 674	9.97 708	5	33	7	27.3	26.6
28	9.50 072	38	9.52 368	42	0.47 632	9.97 704	4	32	8	31.2	30.4
29	9.50 110	38	9.52 410	42	0.47 590	9.97 700	4	31	9	35.1	34.2
30	9.50 148	37	9.52 452	42	0.47 548	9.97 696	4	30			
31	9.50 185	38	9.52 494	42	0.47 506	9.97 691	4	29			
32	9.50 223	38	9.52 536	42	0.47 464	9.97 687	4	28			
33	9.50 261	37	9.52 578	42	0.47 422	9.97 683	4	27			
34	9.50 298	38	9.52 620	41	0.47 380	9.97 679	4	26			
35	9.50 336	38	9.52 661	42	0.47 339	9.97 674	5	25	1	3.7	3.6
36	9.50 374	38	9.52 703	42	0.47 297	9.97 670	4	24	2	7.4	7.2
37	9.50 411	37	9.52 745	42	0.47 255	9.97 666	4	23	3	11.1	10.8
38	9.50 449	38	9.52 787	42	0.47 213	9.97 662	4	22	4	14.8	14.4
39	9.50 486	37	9.52 829	41	0.47 171	9.97 657	5	21	5	18.5	18.0
40	9.50 523	38	9.52 870	42	0.47 130	9.97 653	4	20	6	22.2	21.6
41	9.50 561	37	9.52 912	41	0.47 088	9.97 649	4	19	7	25.9	25.2
42	9.50 598	37	9.52 953	42	0.47 047	9.97 645	4	18	8	29.6	28.8
43	9.50 635	37	9.52 995	42	0.47 005	9.97 640	4	17	9	33.3	32.4
44	9.50 673	37	9.53 037	41	0.46 963	9.97 636	4				
45	9.50 710	37	9.53 078	41	0.46 922	9.97 632	4	15			
46	9.50 747	37	9.53 120	42	0.46 880	9.97 628	4	14			
47	9.50 784	37	9.53 161	41	0.46 839	9.97 623	5	13			
48	9.50 821	37	9.53 202	42	0.46 798	9.97 619	4	12			
49	9.50 858	38	9.53 244	41	0.46 756	9.97 615	5	11	1	0.5	0.4
50	9.50 896	37	9.53 285	42	0.46 715	9.97 610	4	10	2	1.0	0.8
51	9.50 933	37	9.53 327	41	0.46 673	9.97 606	4	9	3	1.5	1.2
52	9.50 970	37	9.53 368	41	0.46 632	9.97 602	4	8	4	2.0	1.6
53	9.51 007	37	9.53 409	41	0.46 591	9.97 597	5	7	5	2.5	2.0
54	9.51 043	37	9.53 450	42	0.46 550	9.97 593	4	6	6	3.0	2.4
55	9.51 080	37	9.53 492	41	0.46 508	9.97 589	4	5	7	3.5	2.8
56	9.51 117	37	9.53 533	41	0.46 467	9.97 584	5	4	8	4.0	3.2
57	9.51 154	37	9.53 574	41	0.46 426	9.97 580	4	3	9	4.5	3.6
58	9.51 191	36	9.53 615	41	0.46 385	9.97 576	4	2			
59	9.51 227	37	9.53 656	41	0.46 344	9.97 571	5	1			
60	9.51 264		9.53 697		0.46 303	9.97 567	4	0			
	L Cos	d	L Cot	cd	L Tan	L Sin	d	I		P P	

/	L Sin	d	L Tan	cd	L Cot	L Cos	d		P P
0	9.51 264	37	9.53 697	41	0.46 303	9.97 567	4	60	
1	9.51 301	37	9.53 738	41	0.46 262	9.97 563	5	59	
2	9.51 338	36	9.53 779	41	0.46 221	9.97 558	5	58	
3	9.51 374	37	9.53 820	41	0.46 180	9.97 554	4	57	
4	9.51 411	37	9.53 861	41	0.46 139	9.97 550	5	56	
5	9.51 447	36	9.53 902	41	0.46 098	9.97 545	5	55	
6	9.51 484	37	9.53 943	41	0.46 057	9.97 541	4	54	
7	9.51 520	36	9.53 984	41	0.46 016	9.97 536	5	53	41 40 39
8	9.51 557	37	9.54 025	41	0.45 975	9.97 532	4	52	1 4.1 4.0 3.9
9	9.51 593	36	9.54 065	40	0.45 935	9.97 528	4	51	2 8.2 8.0 7.8
10	9.51 629	37	9.54 106	41	0.45 894	9.97 523	5	50	3 12.3 12.0 11.7
11	9.51 666	36	9.54 147	40	0.45 853	9.97 519	4	49	4 16.4 16.0 15.6
12	9.51 702	36	9.54 187	40	0.45 813	9.97 515	4	48	5 20.5 20.0 19.5
13	9.51 738	36	9.54 228	41	0.45 772	9.97 510	5	47	6 24.6 24.0 23.4
14	9.51 774	37	9.54 269	40	0.45 731	9.97 506	5	46	7 28.7 28.0 27.3
15	9.51 811	37	9.54 309	40	0.45 691	9.97 501	4	45	8 32.8 32.0 31.2
16	9.51 847	36	9.54 350	40	0.45 650	9.97 497	4	44	9 36.0 36.0 35.1
17	9.51 883	36	9.54 390	40	0.45 610	9.97 492	5	43	
18	9.51 919	36	9.54 431	41	0.45 569	9.97 488	4	42	
19	9.51 955	36	9.54 471	41	0.45 529	9.97 484	4	41	
20	9.51 991	36	9.54 512	40	0.45 488	9.97 479	5	40	37 36
21	9.52 027	36	9.54 552	41	0.45 448	9.97 475	4	39	1 3.7 3.6
22	9.52 063	36	9.54 593	40	0.45 407	9.97 470	5	38	2 7.4 7.2
23	9.52 099	36	9.54 633	40	0.45 367	9.97 466	4	37	3 11.1 10.8
24	9.52 135	36	9.54 673	41	0.45 327	9.97 461	5	36	4 14.8 14.4
25	9.52 171	36	9.54 714	41	0.45 286	9.97 457	4	35	5 18.5 18.0
26	9.52 207	35	9.54 754	40	0.45 246	9.97 453	4	34	6 22.2 21.6
27	9.52 242	36	9.54 794	40	0.45 206	9.97 448	5	33	7 25.9 25.2
28	9.52 278	36	9.54 835	41	0.45 165	9.97 444	4	32	8 29.6 28.8
29	9.52 314	36	9.54 875	40	0.45 125	9.97 439	4	31	9 33.3 32.4
30	9.52 350	35	9.54 915	40	0.45 085	9.97 435	5	30	
31	9.52 385	36	9.54 955	40	0.45 045	9.97 430	5	29	
32	9.52 421	35	9.54 995	40	0.45 005	9.97 426	4	28	
33	9.52 456	36	9.55 035	40	0.44 965	9.97 421	4	27	35 34
34	9.52 492	35	9.55 075	40	0.44 925	9.97 417	5	26	1 3.5 3.4
35	9.52 527	35	9.55 115	40	0.44 885	9.97 412	5	25	2 7.0 6.8
36	9.52 563	36	9.55 155	40	0.44 845	9.97 408	4	24	3 10.5 10.2
37	9.52 598	35	9.55 195	40	0.44 805	9.97 403	5	23	4 14.0 13.6
38	9.52 634	36	9.55 235	40	0.44 765	9.97 399	4	22	5 17.5 17.0
39	9.52 669	35	9.55 275	40	0.44 725	9.97 394	4	21	6 21.0 20.4
40	9.52 705	35	9.55 315	40	0.44 685	9.97 390	5	20	7 24.5 23.8
41	9.52 740	35	9.55 355	40	0.44 645	9.97 385	4	19	8 28.0 27.2
42	9.52 775	35	9.55 395	40	0.44 605	9.97 381	4	18	9 31.5 30.6
43	9.52 811	35	9.55 434	40	0.44 566	9.97 376	4	17	
44	9.52 846	35	9.55 474	40	0.44 526	9.97 372	5	16	
45	9.52 881	35	9.55 514	40	0.44 486	9.97 367	5	15	
46	9.52 916	35	9.55 554	40	0.44 446	9.97 363	4	14	5 2.0 1.6
47	9.52 951	35	9.55 593	40	0.44 407	9.97 358	5	13	6 2.5 2.0
48	9.52 986	35	9.55 633	40	0.44 367	9.97 353	4	12	7 3.0 2.4
49	9.53 021	35	9.55 673	39	0.44 327	9.97 349	5	11	8 4.0 3.2
50	9.53 056	36	9.55 712	40	0.44 288	9.97 344	4	10	9 4.5 3.6
51	9.53 092	34	9.55 752	39	0.44 248	9.97 340	5	9	
52	9.53 126	35	9.55 791	40	0.44 209	9.97 335	4	8	
53	9.53 161	35	9.55 831	39	0.44 169	9.97 331	4	7	
54	9.53 196	35	9.55 870	40	0.44 130	9.97 326	5	6	
55	9.53 231	35	9.55 910	40	0.44 090	9.97 322	5	5	
56	9.53 266	35	9.55 949	39	0.44 051	9.97 317	5	4	
57	9.53 301	35	9.55 989	39	0.44 011	9.97 312	4	3	
58	9.53 336	34	9.56 028	39	0.43 972	9.97 308	5	2	
59	9.53 370	35	9.56 067	40	0.43 933	9.97 303	4	1	
60	9.53 405	35	9.56 107	40	0.43 893	9.97 299	5	0	
	L Cos	d	L Cot	cd	L Tan	L Sin	d	/	P P

/	L Sin	d	L Tan	c d	L Cot	L Cos	d		P P			
0	9.53 405	35	9.56 107	39	0.43 893	9.97 299	5	60				
1	9.53 440	35	9.56 146	39	0.43 854	9.97 294	5	59				
2	9.53 475	35	9.56 185	39	0.43 815	9.97 289	5	58				
3	9.53 509	35	9.56 224	40	0.43 776	9.97 285	4	57				
4	9.53 544	34	9.56 264	39	0.43 736	9.97 280	5	56				
5	9.53 578	34	9.56 303	39	0.43 697	9.97 276	4	55				
6	9.53 613	35	9.56 342	39	0.43 658	9.97 271	5	54	40	39	38	
7	9.53 647	34	9.56 381	39	0.43 619	9.97 266	5	53	1	4.0	3.9	3.8
8	9.53 682	35	9.56 420	39	0.43 580	9.97 262	4	52	2	8.0	7.8	7.6
9	9.53 716	34	9.56 459	39	0.43 541	9.97 257	5	51	3	12.0	11.7	11.4
10	9.53 751	34	9.56 498	39	0.43 502	9.97 252	4	50	4	16.0	15.6	15.2
11	9.53 785	34	9.56 537	39	0.43 463	9.97 248	4	49	5	20.0	19.5	19.0
12	9.53 819	35	9.56 576	39	0.43 424	9.97 243	5	48	6	24.0	23.4	22.8
13	9.53 854	34	9.56 615	39	0.43 385	9.97 238	5	47	7	28.0	27.3	26.6
14	9.53 888	34	9.56 654	39	0.43 346	9.97 234	4	46	8	32.0	31.2	30.4
15	9.53 922	35	9.56 693	39	0.43 307	9.97 229	5	45	9	36.0	35.1	34.2
16	9.53 957	34	9.56 732	39	0.43 268	9.97 224	4	44				
17	9.53 991	34	9.56 771	39	0.43 229	9.97 220	5	43				
18	9.54 025	34	9.56 810	39	0.43 190	9.97 215	5	42				
19	9.54 059	34	9.56 849	39	0.43 151	9.97 210	5	41				
20	9.54 093	34	9.56 887	39	0.43 113	9.97 206	5	40	37	35		
21	9.54 127	34	9.56 926	39	0.43 074	9.97 201	5	39	1	3.7	3.5	
22	9.54 161	34	9.56 965	39	0.43 035	9.97 196	5	38	2	7.4	7.0	
23	9.54 195	34	9.57 004	38	0.42 996	9.97 192	5	37	3	11.1	10.5	
24	9.54 229	34	9.57 042	38	0.42 958	9.97 187	5	36	4	14.8	14.0	
25	9.54 263	34	9.57 081	39	0.42 919	9.97 182	5	35	5	18.5	17.5	
26	9.54 297	34	9.57 120	38	0.42 880	9.97 178	4	34	6	22.2	21.0	
27	9.54 331	34	9.57 158	39	0.42 842	9.97 173	5	33	7	25.9	24.5	
28	9.54 365	34	9.57 197	38	0.42 803	9.97 168	5	32	8	29.6	28.0	
29	9.54 399	34	9.57 235	39	0.42 765	9.97 163	4	31	9	33.3	31.5	
30	9.54 433	33	9.57 274	38	0.42 726	9.97 159	5	30				
31	9.54 466	34	9.57 312	39	0.42 688	9.97 154	5	29				
32	9.54 500	34	9.57 351	39	0.42 649	9.97 149	5	28				
33	9.54 534	33	9.57 389	39	0.42 611	9.97 145	5	27				
34	9.54 567	34	9.57 428	38	0.42 572	9.97 140	5	26				
35	9.54 601	34	9.57 466	38	0.42 534	9.97 135	5	25	1	3.4	3.3	
36	9.54 635	33	9.57 504	39	0.42 496	9.97 130	4	24	2	6.8	6.6	
37	9.54 668	34	9.57 543	38	0.42 457	9.97 126	5	23	3	10.2	9.9	
38	9.54 702	33	9.57 581	38	0.42 419	9.97 121	5	22	4	13.6	13.2	
39	9.54 735	34	9.57 619	38	0.42 381	9.97 116	5	21	5	17.0	16.5	
40	9.54 769	33	9.57 658	38	0.42 342	9.97 111	4	20	6	20.4	19.8	
41	9.54 802	34	9.57 696	38	0.42 304	9.97 107	5	19	7	23.8	23.1	
42	9.54 836	34	9.57 734	38	0.42 266	9.97 102	5	18	8	27.2	26.4	
43	9.54 869	34	9.57 772	38	0.42 228	9.97 097	5	17	9	30.6	29.7	
44	9.54 903	33	9.57 810	39	0.42 190	9.97 092	5	16				
45	9.54 936	33	9.57 849	39	0.42 151	9.97 087	5	15				
46	9.54 969	34	9.57 887	38	0.42 113	9.97 083	4	14				
47	9.55 003	33	9.57 925	38	0.42 075	9.97 078	5	13				
48	9.55 036	33	9.57 963	38	0.42 037	9.97 073	5	12				
49	9.55 069	33	9.58 001	38	0.41 999	9.97 068	5	11				
50	9.55 102	34	9.58 039	38	0.41 961	9.97 063	4	10				
51	9.55 136	33	9.58 077	38	0.41 923	9.97 059	5	9				
52	9.55 169	33	9.58 115	38	0.41 885	9.97 054	5	8				
53	9.55 202	33	9.58 153	38	0.41 847	9.97 049	5	7				
54	9.55 235	33	9.58 191	38	0.41 809	9.97 044	5	6				
55	9.55 268	33	9.58 229	38	0.41 771	9.97 039	4	5				
56	9.55 301	33	9.58 267	37	0.41 733	9.97 035	5	4				
57	9.55 334	33	9.58 304	38	0.41 696	9.97 030	5	3				
58	9.55 367	33	9.58 342	38	0.41 658	9.97 025	5	2				
59	9.55 400	33	9.58 380	38	0.41 620	9.97 020	5	1				
60	9.55 433		9.58 418		0.41 582	9.97 015		0				
	L Cos	d	L Cot	c d	L Tan	L Sin	d	/			P P	

/	L Sin	d	L Tan	c d	L Cot	L Cos	d		P P
0	9.55 433		9.58 418	37	0.41 582	9.97 015	5	60	
1	9.55 466	33	9.58 455	37	0.41 545	9.97 010	5	59	
2	9.55 499	33	9.58 493	38	0.41 507	9.97 005	5	58	
3	9.55 532	33	9.58 531	38	0.41 469	9.97 001	4	57	
4	9.55 564	32	9.58 569	38	0.41 431	9.96 996	5	56	
5	9.55 597	33	9.58 606	37	0.41 394	9.96 991	5	55	
6	9.55 630	33	9.58 644	38	0.41 356	9.96 986	5	54	
7	9.55 663	33	9.58 681	37	0.41 319	9.96 981	5	53	
8	9.55 695	32	9.58 719	38	0.41 281	9.96 976	5	52	
9	9.55 728	33	9.58 757	38	0.41 243	9.96 971	5	51	38 37 36
10	9.55 761	33	9.58 794	37	0.41 206	9.96 966	5	50	1 3.8 3.7 3.6
11	9.55 793	32	9.58 832	38	0.41 168	9.96 962	4	49	2 7.6 7.4 7.2
12	9.55 826	33	9.58 869	37	0.41 131	9.96 957	5	48	3 11.4 11.1 10.8
13	9.55 858	32	9.58 907	38	0.41 093	9.96 952	5	47	4 15.2 14.8 14.4
14	9.55 891	33	9.58 944	37	0.41 056	9.96 947	5	46	5 19.0 18.5 18.0
15	9.55 923	32	9.58 981	37	0.41 019	9.96 942	5	45	6 22.8 22.2 21.6
16	9.55 956	33	9.59 019	38	0.40 981	9.96 937	5	44	7 26.6 25.9 25.2
17	9.55 988		9.59 056	37	0.40 944	9.96 932	5	43	8 30.4 29.6 28.8
18	9.56 021	33	9.59 094	38	0.40 906	9.96 927	5	42	
19	9.56 053	32	9.59 131	37	0.40 869	9.96 922	5	41	
20	9.56 085	33	9.59 168	37	0.40 832	9.96 917	5	40	
21	9.56 118		9.59 205	37	0.40 795	9.96 912	5	39	
22	9.56 150	32	9.59 243	38	0.40 757	9.96 907	5	38	
23	9.56 182	32	9.59 280	37	0.40 720	9.96 903	4	37	
24	9.56 215	33	9.59 317	37	0.40 683	9.96 898	5	36	
25	9.56 247	32	9.59 354	37	0.40 646	9.96 893	5	35	
26	9.56 279	32	9.59 391	38	0.40 609	9.96 888	5	34	33 32 31
27	9.56 311		9.59 429	37	0.40 571	9.96 883	5	33	
28	9.56 343	32	9.59 466	37	0.40 534	9.96 878	5	32	1 3.3 3.2 3.1
29	9.56 375	33	9.59 503	37	0.40 497	9.96 873	5	31	2 6.6 6.4 6.2
30	9.56 408	32	9.59 540	37	0.40 460	9.96 868	5	30	3 9.9 9.6 9.3
31	9.56 440		9.59 577	37	0.40 423	9.96 863	5	29	4 13.2 12.8 12.4
32	9.56 472	32	9.59 614	37	0.40 386	9.96 858	5	28	5 16.5 16.0 15.5
33	9.56 504	32	9.59 651	37	0.40 349	9.96 853	5	27	6 19.8 19.2 18.6
34	9.56 536	32	9.59 688	37	0.40 312	9.96 848	5	26	7 23.1 22.4 21.7
35	9.56 568	31	9.59 725	37	0.40 275	9.96 843	5	25	8 26.4 25.6 24.8
36	9.56 599	32	9.59 762	37	0.40 238	9.96 838	5	24	
37	9.56 631	32	9.59 799	36	0.40 201	9.96 833	5	23	
38	9.56 663	32	9.59 835	36	0.40 165	9.96 828	5	22	
39	9.56 695	32	9.59 872	37	0.40 128	9.96 823	5	21	
40	9.56 727	32	9.59 909	37	0.40 091	9.96 818	5	20	
41	9.56 759	31	9.59 946	37	0.40 054	9.96 813	5	19	
42	9.56 790	32	9.59 983	37	0.40 017	9.96 808	5	18	
43	9.56 822	32	9.60 019	36	0.39 981	9.96 803	5	17	
44	9.56 854	32	9.60 056	37	0.39 944	9.96 798	5	16	
45	9.56 886	31	9.60 093	37	0.39 907	9.96 793	5	15	1 0.6 0.5 0.4
46	9.56 917	31	9.60 130	37	0.39 870	9.96 788	5	14	2 1.2 1.0 0.8
47	9.56 949	31	9.60 166	37	0.39 834	9.96 783	5	13	3 1.8 1.5 1.2
48	9.56 980	32	9.60 203	37	0.39 797	9.96 778	5	12	4 2.4 2.0 1.6
49	9.57 012	32	9.60 240	37	0.39 760	9.96 772	5	11	5 3.0 2.5 2.0
50	9.57 044	31	9.60 276	37	0.39 724	9.96 767	5	10	6 3.6 3.0 2.4
51	9.57 075	32	9.60 313	36	0.39 687	9.96 762	5	9	7 4.2 3.5 2.8
52	9.57 107	31	9.60 349	36	0.39 651	9.96 757	5	8	8 4.8 4.0 3.2
53	9.57 138	31	9.60 386	37	0.39 614	9.96 752	5	7	9 5.4 4.5 3.6
54	9.57 169	32	9.60 422	37	0.39 578	9.96 747	5	6	
55	9.57 201	31	9.60 459	37	0.39 541	9.96 742	5	5	
56	9.57 232	32	9.60 495	36	0.39 505	9.96 737	5	4	
57	9.57 264	31	9.60 532	36	0.39 468	9.96 732	5	3	
58	9.57 295	31	9.60 568	37	0.39 432	9.96 727	5	2	
59	9.57 326	32	9.60 605	36	0.39 395	9.96 722	5	1	
60	9.57 358		9.60 641		0.39 359	9.96 717	5	0	
	L Cos	d	L Cot	c d	L Tan	L Sin	d	/	P P

/	L Sin	d	L Tan	c d	L Cot	L Cos	d	P P				
O	9.57 358	31	9.60 641	36	0.39 359	9.96 717	6	60				
1	9.57 389	31	9.60 677	37	0.39 323	9.96 711	5	59				
2	9.57 420	31	9.60 714	36	0.39 286	9.96 706	5	58				
3	9.57 451	31	9.60 750	36	0.39 250	9.96 701	5	57				
4	9.57 482	32	9.60 786	37	0.39 214	9.96 696	5	56				
5	9.57 514	32	9.60 823	36	0.39 177	9.96 691	5	55				
6	9.57 545	31	9.60 859	36	0.39 141	9.96 686	5	54				
7	9.57 576	31	9.60 895	36	0.39 105	9.96 681	5	53	37	36	35	
8	9.57 607	31	9.60 931	36	0.39 069	9.96 676	5	52	1	3.7	3.6	3.5
9	9.57 638	31	9.60 967	37	0.39 033	9.96 670	6	51	2	7.4	7.2	7.0
									3	11.1	10.8	10.5
									4	14.8	14.4	14.0
									5	18.5	18.0	17.5
									6	22.2	21.6	21.0
									7	25.9	25.2	24.5
									8	29.0	28.8	28.0
									9	33.3	32.4	31.5
10	9.57 669	31	9.61 004	36	0.38 996	9.96 665	5	50				
11	9.57 700	31	9.61 040	36	0.38 960	9.96 660	5	49				
12	9.57 731	31	9.61 076	36	0.38 924	9.96 655	5	48				
13	9.57 762	31	9.61 112	36	0.38 888	9.96 650	5	47				
14	9.57 793	31	9.61 148	36	0.38 852	9.96 645	5	46				
15	9.57 824	31	9.61 184	36	0.38 816	9.96 640	5	45				
16	9.57 855	30	9.61 220	36	0.38 780	9.96 634	6	44				
17	9.57 885	31	9.61 256	36	0.38 744	9.96 629	5	43				
18	9.57 916	31	9.61 292	36	0.38 708	9.96 624	5	42				
19	9.57 947	31	9.61 328	36	0.38 672	9.96 619	5	41				
20	9.57 978	30	9.61 364	36	0.38 636	9.96 614	6	40				
21	9.58 008	31	9.61 400	36	0.38 600	9.96 608	5	39				
22	9.58 039	31	9.61 436	36	0.38 564	9.96 603	5	38				
23	9.58 070	31	9.61 472	36	0.38 528	9.96 598	5	37				
24	9.58 101	30	9.61 508	36	0.38 492	9.96 593	5	36				
25	9.58 131	30	9.61 544	36	0.38 456	9.96 588	5	35				
26	9.58 162	30	9.61 579	35	0.38 421	9.96 582	6	34				
27	9.58 192	31	9.61 615	36	0.38 385	9.96 577	5	33				
28	9.58 223	31	9.61 651	36	0.38 349	9.96 572	5	32				
29	9.58 253	31	9.61 687	36	0.38 313	9.96 567	5	31				
30	9.58 284	30	9.61 722	36	0.38 278	9.96 562	6	30				
31	9.58 314	31	9.61 758	36	0.38 242	9.96 556	5	29				
32	9.58 345	30	9.61 794	36	0.38 206	9.96 551	5	28				
33	9.58 375	31	9.61 830	36	0.38 170	9.96 546	5	27				
34	9.58 406	30	9.61 865	36	0.38 135	9.96 541	5	26				
35	9.58 436	30	9.61 901	36	0.38 099	9.96 535	6	25				
36	9.58 467	30	9.61 936	35	0.38 064	9.96 530	5	24				
37	9.58 497	30	9.61 972	36	0.38 028	9.96 525	5	23				
38	9.58 527	30	9.62 008	36	0.37 992	9.96 520	5	22				
39	9.58 557	31	9.62 043	35	0.37 957	9.96 514	5	21				
									8	24.0	23.2	21.9
40	9.58 588	30	9.62 079	35	0.37 921	9.96 509	5	20				
41	9.58 618	30	9.62 114	36	0.37 886	9.96 504	6	19				
42	9.58 648	30	9.62 150	35	0.37 850	9.96 498	5	18				
43	9.58 678	31	9.62 185	36	0.37 815	9.96 493	5	17				
44	9.58 709	30	9.62 221	35	0.37 779	9.96 488	5	16				
45	9.58 739	30	9.62 256	35	0.37 744	9.96 483	6	15				
46	9.58 769	30	9.62 292	35	0.37 708	9.96 477	5	14				
47	9.58 799	30	9.62 327	35	0.37 673	9.96 472	5	13				
48	9.58 829	30	9.62 362	36	0.37 638	9.96 467	5	12				
49	9.58 859	30	9.62 398	35	0.37 602	9.96 461	5	11				
									1	0.6	0.5	
50	9.58 889	30	9.62 433	35	0.37 567	9.96 456	5	10				
51	9.58 919	30	9.62 468	36	0.37 532	9.96 451	6	9				
52	9.58 949	30	9.62 504	35	0.37 496	9.96 445	5	8				
53	9.58 979	30	9.62 539	35	0.37 461	9.96 440	5	7				
54	9.59 009	30	9.62 574	35	0.37 426	9.96 435	6	6				
55	9.59 039	30	9.62 609	35	0.37 391	9.96 429	5	5				
56	9.59 069	29	9.62 645	35	0.37 355	9.96 424	5	4				
57	9.59 098	30	9.62 680	35	0.37 320	9.96 419	6	3				
58	9.59 128	30	9.62 715	35	0.37 285	9.96 413	5	2				
59	9.59 158	30	9.62 750	35	0.37 250	9.96 408	5	1				
60	9.59 188		9.62 785		0.37 215	9.96 403		O				
	L Cos	d	L Cot	c d	L Tan	L Sin	d	/		P P		

I	L Sin	d	L Tan	c d	L Cot	L Cos	d	P P		
0	9.59 188	30	9.62 785	35	0.37 215	9.96 403	6	60		
1	9.59 218	29	9.62 820	35	0.37 180	9.96 397	5	59		
2	9.59 247	30	9.62 855	35	0.37 145	9.96 392	5	58		
3	9.59 277	30	9.62 890	35	0.37 110	9.96 387	6	57		
4	9.59 307	29	9.62 926	35	0.37 074	9.96 381		56		
5	9.59 336	29	9.62 961	35	0.37 039	9.96 376	5	55		
6	9.59 366	30	9.62 996	35	0.37 004	9.96 370	6	54		
7	9.59 396	29	9.63 031	35	0.36 969	9.96 365	5	53		
8	9.59 425	30	9.63 066	35	0.36 934	9.96 360	6	52		
9	9.59 455	29	9.63 101	35	0.36 899	9.96 354	5	51		
10	9.59 484	30	9.63 135	35	0.36 865	9.96 349	6	50	36	35
11	9.59 514	29	9.63 170	35	0.36 830	9.96 343	5	49	3.6	3.5
12	9.59 543	30	9.63 205	35	0.36 795	9.96 338	5	48	7.2	6.8
13	9.59 573	29	9.63 240	35	0.36 760	9.96 333	6	47	10.8	10.2
14	9.59 602	29	9.63 275	35	0.36 725	9.96 327	5	46	14.4	14.0
15	9.59 632	30	9.63 310	35	0.36 690	9.96 322	5	45	18.0	17.5
16	9.59 661	29	9.63 345	35	0.36 655	9.96 316	6	44	21.6	20.4
17	9.59 690	29	9.63 379	34	0.36 621	9.96 311	6	43	25.2	23.8
18	9.59 720	30	9.63 414	35	0.36 586	9.96 305	5	42	28.8	28.0
19	9.59 749	29	9.63 449	35	0.36 551	9.96 300	6	41	32.4	31.5
20	9.59 778	29	9.63 484	35	0.36 516	9.96 294		40		
21	9.59 808	30	9.63 519	35	0.36 481	9.96 289	5	39		
22	9.59 837	29	9.63 553	34	0.36 447	9.96 284	5	38		
23	9.59 866	29	9.63 588	35	0.36 412	9.96 278	5	37		
24	9.59 895	29	9.63 623	35	0.36 377	9.96 273	6	36		
25	9.59 924	29	9.63 657	34	0.36 343	9.96 267	6	35		
26	9.59 954	30	9.63 692	35	0.36 308	9.96 262	5	34		
27	9.59 983	29	9.63 726	34	0.36 274	9.96 256	5	33		
28	9.60 012	29	9.63 761	35	0.36 239	9.96 251	6	32		
29	9.60 041	29	9.63 796	35	0.36 204	9.96 245	5	31		
30	9.60 070	29	9.63 830	35	0.36 170	9.96 240	6	30		
31	9.60 099	29	9.63 865	34	0.36 135	9.96 234	5	29		
32	9.60 128	29	9.63 899	34	0.36 101	9.96 229	6	28		
33	9.60 157	29	9.63 934	35	0.36 066	9.96 223	5	27		
34	9.60 186	29	9.63 968	34	0.36 032	9.96 218	6	26		
35	9.60 215	29	9.64 003	35	0.35 997	9.96 212	5	25		
36	9.60 244	29	9.64 037	34	0.35 963	9.96 207	5	24		
37	9.60 273	29	9.64 072	35	0.35 928	9.96 201	5	23		
38	9.60 302	29	9.64 106	34	0.35 894	9.96 196	6	22		
39	9.60 331	28	9.64 140	34	0.35 860	9.96 190	5	21		
40	9.60 359	29	9.64 175	34	0.35 825	9.96 185	6	20		
41	9.60 388	29	9.64 209	34	0.35 791	9.96 179	5	19		
42	9.60 417	29	9.64 243	34	0.35 757	9.96 174	6	18		
43	9.60 446	28	9.64 278	35	0.35 722	9.96 168	6	17		
44	9.60 474	29	9.64 312	34	0.35 688	9.96 162	5	16		
45	9.60 503	29	9.64 346	34	0.35 654	9.96 157	6	15		
46	9.60 532	29	9.64 381	35	0.35 619	9.96 151	5	14		
47	9.60 561	29	9.64 415	34	0.35 585	9.96 146	6	13		
48	9.60 589	28	9.64 449	34	0.35 551	9.96 140	5	12		
49	9.60 618	28	9.64 483	34	0.35 517	9.96 135	6	11		
50	9.60 646	29	9.64 517	35	0.35 483	9.96 129	6	10		
51	9.60 675	29	9.64 552	35	0.35 448	9.96 123	5	9		
52	9.60 704	28	9.64 586	34	0.35 414	9.96 118	6	8		
53	9.60 732	29	9.64 620	34	0.35 380	9.96 112	5	7		
54	9.60 761	28	9.64 654	34	0.35 346	9.96 107	6	6		
55	9.60 789	28	9.64 688	34	0.35 312	9.96 101	6	5		
56	9.60 818	29	9.64 722	34	0.35 278	9.96 095	5	4		
57	9.60 846	29	9.64 756	34	0.35 244	9.96 090	6	3		
58	9.60 875	28	9.64 790	34	0.35 210	9.96 084	5	2		
59	9.60 903	28	9.64 824	34	0.35 176	9.96 079	6	1		
60	9.60 931		9.64 858		0.35 142	9.96 073		0		
	L Cos	d	L Cot	c d	L Tan	L Sin	d	I	P P	

I	L Sin	d	L Tan	c d	L Cot	L Cos	d	P P									
								L Cos	d	L Cot	c d	L Tan	L Sin	d	I	P P	
0	9.60 931	29	9.64 858	34	0.35 142	9.96 073	6	60									
1	9.60 960	28	9.64 892	34	0.35 108	9.96 067	6	59									
2	9.60 988	28	9.64 926	34	0.35 074	9.96 062	5	58									
3	9.61 016	28	9.64 960	34	0.35 040	9.96 056	6	57									
4	9.61 045	28	9.64 994	34	0.35 006	9.96 050	6	56									
5	9.61 073	28	9.65 028	34	0.34 972	9.96 045	5	55									
6	9.61 101	28	9.65 062	34	0.34 938	9.96 039	6	54									
7	9.61 129	28	9.65 096	34	0.34 904	9.96 034	5	53									
8	9.61 158	29	9.65 130	34	0.34 870	9.96 028	6	52									
9	9.61 186	28	9.65 164	34	0.34 836	9.96 022	6	51									
10	9.61 214	28	9.65 197	34	0.34 803	9.96 017	5	50							34	33	
11	9.61 242	28	9.65 231	34	0.34 769	9.96 011	6	49									
12	9.61 270	28	9.65 265	34	0.34 735	9.96 005	6	48									
13	9.61 298	28	9.65 299	34	0.34 701	9.96 000	5	47									
14	9.61 326	28	9.65 333	34	0.34 667	9.95 994	6	46									
15	9.61 354	28	9.65 366	33	0.34 634	9.95 988	6	45									
16	9.61 382	28	9.65 400	34	0.34 600	9.95 982	6	44									
17	9.61 411	28	9.65 434	33	0.34 566	9.95 977	5	43									
18	9.61 438	27	9.65 467	33	0.34 533	9.95 971	6	42									
19	9.61 466	28	9.65 501	34	0.34 499	9.95 965	5	41									
20	9.61 494	28	9.65 535	33	0.34 465	9.95 960	6	40									
21	9.61 522	28	9.65 568	34	0.34 432	9.95 954	6	39									
22	9.61 550	28	9.65 602	34	0.34 398	9.95 948	6	38									
23	9.61 578	28	9.65 636	34	0.34 364	9.95 942	5	37									
24	9.61 606	28	9.65 669	33	0.34 331	9.95 937	6	36									
25	9.61 634	28	9.65 703	34	0.34 297	9.95 931	6	35									
26	9.61 662	28	9.65 736	33	0.34 264	9.95 925	6	34									
27	9.61 689	28	9.65 770	34	0.34 230	9.95 920	5	33							29	28	27
28	9.61 717	28	9.65 803	33	0.34 197	9.95 914	6	32									
29	9.61 745	28	9.65 837	33	0.34 163	9.95 908	6	31									
30	9.61 773	27	9.65 870	34	0.34 130	9.95 902	5	30									
31	9.61 800	28	9.65 904	34	0.34 096	9.95 897	6	29									
32	9.61 828	28	9.65 937	33	0.34 063	9.95 891	6	28									
33	9.61 856	27	9.65 971	33	0.34 029	9.95 885	6	27									
34	9.61 883	28	9.66 004	33	0.33 996	9.95 879	6	26									
35	9.61 911	28	9.66 038	34	0.33 962	9.95 873	5	25									
36	9.61 939	27	9.66 071	33	0.33 929	9.95 868	6	24									
37	9.61 966	28	9.66 104	33	0.33 890	9.95 862	6	23									
38	9.61 994	28	9.66 138	34	0.33 862	9.95 856	6	22									
39	9.62 021	27	9.66 171	33	0.33 829	9.95 850	6	21									
40	9.62 049	27	9.66 204	34	0.33 796	9.95 844	5	20							6	5	
41	9.62 076	28	9.66 238	33	0.33 762	9.95 839	6	19									
42	9.62 104	28	9.66 271	33	0.33 729	9.95 833	6	18									
43	9.62 131	28	9.66 304	33	0.33 696	9.95 827	6	17									
44	9.62 159	27	9.66 337	34	0.33 663	9.95 821	6	16									
45	9.62 186	28	9.66 371	34	0.33 629	9.95 815	6	15									
46	9.62 214	27	9.66 404	33	0.33 596	9.95 810	5	14									
47	9.62 241	27	9.66 437	33	0.33 563	9.95 804	6	13									
48	9.62 268	27	9.66 470	33	0.33 530	9.95 798	6	12									
49	9.62 296	27	9.66 503	33	0.33 497	9.95 792	6	11									
50	9.62 323	27	9.66 537	33	0.33 463	9.95 786	6	10									
51	9.62 350	27	9.66 570	33	0.33 430	9.95 780	5	9									
52	9.62 377	28	9.66 603	33	0.33 397	9.95 775	6	8									
53	9.62 405	27	9.66 636	33	0.33 364	9.95 769	6	7									
54	9.62 432	28	9.66 669	33	0.33 331	9.95 763	6	6									
55	9.62 459	27	9.66 702	33	0.33 298	9.95 757	6	5									
56	9.62 486	27	9.66 735	33	0.33 265	9.95 751	6	4									
57	9.62 513	28	9.66 768	33	0.33 232	9.95 745	6	3									
58	9.62 541	27	9.66 801	33	0.33 199	9.95 739	6	2									
59	9.62 568	27	9.66 834	33	0.33 166	9.95 733	5	1									
60	9.62 595	27	9.66 867	33	0.33 133	9.95 728	0										
	L Cos	d	L Cot	c d	L Tan	L Sin	d	I							P P		

/	L Sin	d	L Tan	cd	L Cot	L Cos	d	P P		
0	9.62 595	27	9.66 867	33	0.33 133	9.95 728	6	60		
1	9.62 622	27	9.66 900	33	0.33 100	9.95 722	6	59		
2	9.62 649	27	9.66 933	33	0.33 067	9.95 716	6	58		
3	9.62 676	27	9.66 966	33	0.33 034	9.95 710	6	57		
4	9.62 703	27	9.66 999	33	0.33 001	9.95 704	6	56		
5	9.62 730	27	9.67 032	33	0.32 968	9.95 698	6	55		
6	9.62 757	27	9.67 065	33	0.32 935	9.95 692	6	54		
7	9.62 784	27	9.67 098	33	0.32 902	9.95 686	6	53		
8	9.62 811	27	9.67 131	33	0.32 869	9.95 680	6	52		
9	9.62 838	27	9.67 163	33	0.32 837	9.95 674	6	51		
10	9.62 865	27	9.67 196	33	0.32 804	9.95 668	6	50		
11	9.62 892	26	9.67 229	33	0.32 771	9.95 663	5	49	1	3.3
12	9.62 918	26	9.67 262	33	0.32 738	9.95 657	6	48	2	6.6
13	9.62 945	27	9.67 295	33	0.32 705	9.95 651	6	47	3	9.9
14	9.62 972	27	9.67 327	32	0.32 673	9.95 645	6	46	4	13.2
15	9.62 999	27	9.67 360	33	0.32 640	9.95 639	6	45	5	16.5
16	9.63 026	27	9.67 393	33	0.32 607	9.95 633	6	44	6	16.0
17	9.63 052	27	9.67 426	33	0.32 574	9.95 627	6	43	7	19.8
18	9.63 079	27	9.67 458	32	0.32 542	9.95 621	6	42	8	23.1
19	9.63 106	27	9.67 491	33	0.32 509	9.95 615	6	41	9	26.4
20	9.63 133	26	9.67 524	32	0.32 476	9.95 609	6	40		28.8
21	9.63 159	27	9.67 556	33	0.32 444	9.95 603	6		1	3.2
22	9.63 186	27	9.67 589	33	0.32 411	9.95 597	6		2	6.4
23	9.63 213	27	9.67 622	33	0.32 378	9.95 591	6		3	9.6
24	9.63 239	27	9.67 654	32	0.32 346	9.95 585	6		4	12.8
25	9.63 266	27	9.67 687	33	0.32 313	9.95 579	6		5	16.0
26	9.63 292	27	9.67 719	32	0.32 281	9.95 573	6		6	19.2
27	9.63 319	26	9.67 752	33	0.32 248	9.95 567	6		7	22.4
28	9.63 345	26	9.67 785	32	0.32 215	9.95 561	6		8	25.6
29	9.63 372	26	9.67 817	33	0.32 183	9.95 555	6		9	28.8
30	9.63 398	27	9.67 850	32	0.32 150	9.95 549	6	30		
31	9.63 425	26	9.67 882	33	0.32 118	9.95 543	6	29	1	2.7
32	9.63 451	27	9.67 915	32	0.32 085	9.95 537	6	28	2	5.4
33	9.63 478	27	9.67 947	32	0.32 053	9.95 531	6	27	3	8.1
34	9.63 504	27	9.68 980	33	0.32 020	9.95 525	6	26	4	10.8
35	9.63 531	26	9.68 012	32	0.31 988	9.95 519	6	25	5	13.5
36	9.63 557	26	9.68 044	32	0.31 956	9.95 513	6	24	6	16.2
37	9.63 583	26	9.68 077	33	0.31 923	9.95 507	6	23	7	18.0
38	9.63 610	27	9.68 109	32	0.31 891	9.95 500	7	22	8	21.0
39	9.63 636	26	9.68 142	33	0.31 858	9.95 494	6	21	9	23.4
40	9.63 662	27	9.68 174	32	0.31 826	9.95 488	6	20		
41	9.63 689	26	9.68 206	33	0.31 794	9.95 482	6		1	2.6
42	9.63 715	26	9.68 239	32	0.31 761	9.95 476	6		2	5.2
43	9.63 741	26	9.68 271	32	0.31 729	9.95 470	6		3	7.8
44	9.63 767	27	9.68 303	33	0.31 697	9.95 464	6		4	10.4
45	9.63 794	27	9.68 336	32	0.31 664	9.95 458	6		5	13.0
46	9.63 820	26	9.68 368	32	0.31 632	9.95 452	6		6	15.6
47	9.63 846	26	9.68 400	32	0.31 600	9.95 446	6		7	18.2
48	9.63 872	26	9.68 432	32	0.31 568	9.95 440	6		8	20.8
49	9.63 898	26	9.68 465	33	0.31 535	9.95 434	7		9	23.4
50	9.63 924	26	9.68 497	32	0.31 503	9.95 427	6	10		
51	9.63 950	26	9.68 529	32	0.31 471	9.95 421	6	9	1	0.7
52	9.63 976	26	9.68 561	32	0.31 439	9.95 415	6	8	2	1.4
53	9.64 002	26	9.68 593	33	0.31 407	9.95 409	6	7	3	2.1
54	9.64 028	26	9.68 626	32	0.31 374	9.95 403	6	6	4	2.8
55	9.64 054	26	9.68 658	32	0.31 342	9.95 397	6	5	5	3.5
56	9.64 080	26	9.68 690	32	0.31 310	9.95 391	7	4	6	3.0
57	9.64 106	26	9.68 722	32	0.31 278	9.95 384	6	3	7	4.2
58	9.64 132	26	9.68 754	32	0.31 246	9.95 378	6	2	8	4.8
59	9.64 158	26	9.68 786	32	0.31 214	9.95 372	6	1	9	4.0
60	9.64 184		9.68 818		0.31 182	9.95 366		0		4.5
	L Cos	d	L Cot	cd	L Tan	L Sin	d	/	P P	

'	L Sin	d	L Tan	c d	L Cot	L Cos	d	P P		
O	9.64 184	26	9.68 818	32	0.31 182	9.95 366	6	60		
1	9.64 210	26	9.68 850	32	0.31 150	9.95 360	6	59		
2	9.64 236	26	9.68 882	32	0.31 118	9.95 354	6	58		
3	9.64 262	26	9.68 914	32	0.31 086	9.95 348	6	57		
4	9.64 288	26	9.68 946	32	0.31 054	9.95 341	7	56		
5	9.64 313	25	9.68 978	32	0.31 022	9.95 335	6	55		
6	9.64 339	26	9.69 010	32	0.30 990	9.95 329	6	54		
7	9.64 365	26	9.69 042	32	0.30 958	9.95 323	6	53		
8	9.64 391	26	9.69 074	32	0.30 926	9.95 317	6	52		
9	9.64 417	25	9.69 106	32	0.30 894	9.95 310	7	51		
10	9.64 442	26	9.69 138	32	0.30 862	9.95 304	6	50	32	31
11	9.64 468	26	9.69 170	32	0.30 830	9.95 298	6	49	1	3.2
12	9.64 494	26	9.69 202	32	0.30 798	9.95 292	6	48	2	6.4
13	9.64 519	25	9.69 234	32	0.30 766	9.95 286	6	47	3	9.6
14	9.64 545	26	9.69 266	32	0.30 734	9.95 279	7	46	4	12.8
15	9.64 571	26	9.69 298	32	0.30 702	9.95 273	6	45	5	16.0
16	9.64 596	25	9.69 329	31	0.30 671	9.95 267	6	44	6	19.2
17	9.64 622	26	9.69 361	32	0.30 639	9.95 261	6	43	7	18.6
18	9.64 647	25	9.69 393	32	0.30 607	9.95 254	7	42	8	22.4
19	9.64 673	25	9.69 425	32	0.30 575	9.95 248	6	41	9	21.7
20	9.64 698	26	9.69 457	31	0.30 543	9.95 242	6	40		
21	9.64 724	25	9.69 488	32	0.30 512	9.95 236	7	39		
22	9.64 749	25	9.69 520	32	0.30 480	9.95 229	6	38		
23	9.64 775	25	9.69 552	32	0.30 448	9.95 223	6	37		
24	9.64 800	26	9.69 584	31	0.30 416	9.95 217	6	36		
25	9.64 826	26	9.69 615	31	0.30 385	9.95 211	6	35		
26	9.64 851	25	9.69 647	32	0.30 353	9.95 204	7	34		
27	9.64 877	25	9.69 679	31	0.30 321	9.95 198	6	33	26	25
28	9.64 902	25	9.69 710	32	0.30 290	9.95 192	7	32	1	2.6
29	9.64 927	26	9.69 742	32	0.30 258	9.95 185	6	31	2	5.2
30	9.64 953	25	9.69 774	31	0.30 226	9.95 179	6	30	3	5.0
31	9.64 978	25	9.69 805	32	0.30 195	9.95 173	6	29	4	4.8
32	9.65 003	25	9.69 837	32	0.30 163	9.95 167	7	28	5	10.4
33	9.65 029	25	9.69 868	31	0.30 132	9.95 160	6	27	6	13.0
34	9.65 054	25	9.69 900	32	0.30 100	9.95 154	6	26	7	15.6
35	9.65 079	25	9.69 932	32	0.30 068	9.95 148	7	25	8	18.2
36	9.65 104	26	9.69 963	31	0.30 037	9.95 141	6	24	9	20.8
37	9.65 130	25	9.69 995	32	0.30 005	9.95 135	6	23		
38	9.65 155	25	9.70 026	31	0.29 974	9.95 129	7	22		
39	9.65 180	25	9.70 058	32	0.29 942	9.95 122	6	21		
40	9.65 205	25	9.70 089	32	0.29 911	9.95 116	6	20	7	6
41	9.65 230	25	9.70 121	31	0.29 879	9.95 110	7	19		
42	9.65 255	25	9.70 152	31	0.29 848	9.95 103	6	18		
43	9.65 281	26	9.70 184	32	0.29 816	9.95 097	7	17		
44	9.65 306	25	9.70 215	31	0.29 785	9.95 090	6	16		
45	9.65 331	25	9.70 247	32	0.29 753	9.95 084	6	15	1	0.7
46	9.65 356	25	9.70 278	31	0.29 722	9.95 078	7	14	2	1.4
47	9.65 381	25	9.70 309	31	0.29 691	9.95 071	6	13	3	2.1
48	9.65 406	25	9.70 341	31	0.29 659	9.95 065	6	12	4	1.8
49	9.65 431	25	9.70 372	32	0.29 628	9.95 059	7	11	5	2.8
50	9.65 456	25	9.70 404	31	0.29 596	9.95 052	6	10	6	3.5
51	9.65 481	25	9.70 435	31	0.29 565	9.95 046	7	9	7	3.0
52	9.65 506	25	9.70 466	31	0.29 534	9.95 039	6	8	8	4.2
53	9.65 531	25	9.70 498	32	0.29 502	9.95 033	6	7	9	4.9
54	9.65 556	24	9.70 529	31	0.29 471	9.95 027	7	6		
55	9.65 580	25	9.70 560	32	0.29 440	9.95 020	6	5		
56	9.65 605	25	9.70 592	31	0.29 408	9.95 014	7	4		
57	9.65 630	25	9.70 623	31	0.29 377	9.95 007	6	3		
58	9.65 655	25	9.70 654	31	0.29 346	9.95 001	6	2		
59	9.65 680	25	9.70 685	32	0.29 315	9.94 995	7	1		
60	9.65 705	—	9.70 717	—	0.29 283	9.94 988	—	0		
	L Cos	d	L Cot	c d	L Tan	L Sin	d	I	P P	

I	L Sin	d	L Tan	c d	L Cot	L Cos	d		P P
0	9.65 705	24	9.70 717	31	0.29 283	9.94 988	6	60	
1	9.65 729	25	9.70 748	31	0.29 252	9.94 982	7	59	
2	9.65 754	25	9.70 779	31	0.29 221	9.94 975	6	58	
3	9.65 779	25	9.70 810	31	0.29 190	9.94 969	7	57	
4	9.65 804	25	9.70 841	31	0.29 159	9.94 962	6	56	
5	9.65 828	24	9.70 873	32	0.29 127	9.94 956	6	55	
6	9.65 853	25	9.70 904	31	0.29 096	9.94 949	7	54	
7	9.65 878	25	9.70 935	31	0.29 065	9.94 943	6	53	
8	9.65 902	24	9.70 966	31	0.29 034	9.94 936	7	52	
9	9.65 927	25	9.70 997	31	0.29 003	9.94 930	6	51	
10	9.65 952	24	9.71 028	31	0.28 972	9.94 923	7	50	32 31 30
11	9.65 976	25	9.71 059	31	0.28 941	9.94 917	6	49	I 3.2 3.1 3.0
12	9.66 001	25	9.71 090	31	0.28 910	9.94 911	6	48	2 0.4 0.2 0.0
13	9.66 025	24	9.71 121	31	0.28 879	9.94 904	7	47	3 9.6 9.3 9.0
14	9.66 050	25	9.71 153	32	0.28 847	9.94 898	6	46	4 12.8 12.4 12.0
15	9.66 075	25	9.71 184	31	0.28 816	9.94 891	7	45	5 16.0 15.5 15.0
16	9.66 099	24	9.71 215	31	0.28 785	9.94 885	6	44	6 19.2 18.6 18.0
17	9.66 124	25	9.71 246	31	0.28 754	9.94 878	7	43	7 22.4 21.7 21.0
18	9.66 148	24	9.71 277	31	0.28 723	9.94 871	7	42	8 25.6 24.8 24.0
19	9.66 173	24	9.71 308	31	0.28 692	9.94 865	7	41	9 28.8 27.9 27.0
20	9.66 197	24	9.71 339	31	0.28 661	9.94 858	6	40	
21	9.66 221	25	9.71 370	31	0.28 630	9.94 852	7	39	
22	9.66 246	25	9.71 401	30	0.28 599	9.94 845	6	38	
23	9.66 270	24	9.71 431	31	0.28 569	9.94 839	6	37	
24	9.66 295	25	9.71 462	31	0.28 538	9.94 832	7	36	
25	9.66 319	24	9.71 493	31	0.28 507	9.94 826	6	35	
26	9.66 343	24	9.71 524	31	0.28 476	9.94 819	7	34	
27	9.66 368	25	9.71 555	31	0.28 445	9.94 813	6	33	25 24 23
28	9.66 392	24	9.71 586	31	0.28 414	9.94 806	7	32	I 2.5 2.4 2.3
29	9.66 416	24	9.71 617	31	0.28 383	9.94 799	6	31	2 5.0 4.8 4.6
30	9.66 441	24	9.71 648	31	0.28 352	9.94 793	7	30	3 7.5 7.2 6.9
31	9.66 465	24	9.71 679	30	0.28 321	9.94 786	6	29	4 10.0 9.6 9.2
32	9.66 489	24	9.71 709	31	0.28 291	9.94 780	7	28	5 12.5 12.0 11.5
33	9.66 513	24	9.71 740	31	0.28 260	9.94 773	7	27	6 15.0 14.4 13.8
34	9.66 537	25	9.71 771	31	0.28 229	9.94 767	7	26	7 17.5 16.8 16.1
35	9.66 562	25	9.71 802	31	0.28 198	9.94 760	7	25	8 20.0 19.2 18.4
36	9.66 586	24	9.71 833	31	0.28 167	9.94 753	6	24	9 22.5 21.6 20.7
37	9.66 610	24	9.71 863	30	0.28 137	9.94 747	7	23	
38	9.66 634	24	9.71 894	31	0.28 106	9.94 740	7	22	
39	9.66 658	24	9.71 925	30	0.28 075	9.94 734	7	21	
40	9.66 682	24	9.71 955	31	0.28 045	9.94 727	7	20	
41	9.66 706	25	9.71 986	31	0.28 014	9.94 720	6	19	
42	9.66 731	24	9.72 017	31	0.27 983	9.94 714	7	18	
43	9.66 755	24	9.72 048	30	0.27 952	9.94 707	7	17	
44	9.66 779	24	9.72 078	31	0.27 922	9.94 700	6	16	
45	9.66 803	24	9.72 109	31	0.27 891	9.94 694	7	15	
46	9.66 827	24	9.72 140	30	0.27 860	9.94 687	7	14	
47	9.66 851	24	9.72 170	31	0.27 830	9.94 680	6	13	
48	9.66 875	24	9.72 201	31	0.27 799	9.94 674	7	12	
49	9.66 899	23	9.72 231	31	0.27 769	9.94 667	7	11	
50	9.66 922	24	9.72 262	31	0.27 738	9.94 660	6	10	
51	9.66 946	24	9.72 293	30	0.27 707	9.94 654	7	9	
52	9.66 970	24	9.72 323	30	0.27 677	9.94 647	7	8	
53	9.66 994	24	9.72 354	31	0.27 646	9.94 640	6	7	
54	9.67 018	24	9.72 384	30	0.27 616	9.94 634	7	6	
55	9.67 042	24	9.72 415	31	0.27 585	9.94 627	7	5	
56	9.67 066	24	9.72 445	30	0.27 555	9.94 620	6	4	
57	9.67 090	23	9.72 476	30	0.27 524	9.94 614	7	3	
58	9.67 113	24	9.72 506	31	0.27 494	9.94 607	7	2	
59	9.67 137	24	9.72 537	30	0.27 463	9.94 600	7	1	
60	9.67 161	24	9.72 567	31	0.27 433	9.94 593	7	O	
	L Cos	d	L Cot	c d	L Tan	L Sin	d	I	P P

	L Sin	d	L Tan	c d	L Cot	L Cos	d		P P
0	9.67 161	24	9.72 567	31	0.27 433	9.94 593	6	60	
1	9.67 185	24	9.72 598	30	0.27 402	9.94 587	59		
2	9.67 208	23	9.72 628	30	0.27 372	9.94 580	58		
3	9.67 232	24	9.72 659	31	0.27 341	9.94 573	57		
4	9.67 256	24	9.72 689	31	0.27 311	9.94 567	56		
5	9.67 280	24	9.72 720	30	0.27 280	9.94 560	55		
6	9.67 303	23	9.72 750	30	0.27 250	9.94 553	54		
7	9.67 327	23	9.72 780	30	0.27 220	9.94 546	53		
8	9.67 350	23	9.72 811	31	0.27 189	9.94 540	52		
9	9.67 374	24	9.72 841	30	0.27 159	9.94 533	51		
10	9.67 398	23	9.72 872	30	0.27 128	9.94 526	50	31	30
11	9.67 421	24	9.72 902	30	0.27 098	9.94 519	49	1	3.1
12	9.67 445	24	9.72 932	30	0.27 068	9.94 513	48	2	6.2
13	9.67 468	23	9.72 963	31	0.27 037	9.94 506	47	3	9.3
14	9.67 492	24	9.72 993	30	0.27 007	9.94 499	46	4	12.4
15	9.67 515	23	9.73 023	30	0.26 977	9.94 492	45	5	15.5
16	9.67 539	24	9.73 054	31	0.26 946	9.94 485	44	6	18.6
17	9.67 562	23	9.73 084	30	0.26 916	9.94 479	43	7	21.7
18	9.67 586	24	9.73 114	30	0.26 886	9.94 472	42	8	21.0
19	9.67 609	23	9.73 144	30	0.26 856	9.94 465	41	9	20.3
20	9.67 633	23	9.73 175	30	0.26 825	9.94 458	40		
21	9.67 656	24	9.73 205	30	0.26 795	9.94 451	39		
22	9.67 680	24	9.73 235	30	0.26 765	9.94 445	38		
23	9.67 703	23	9.73 265	30	0.26 735	9.94 438	37		
24	9.67 726	23	9.73 295	30	0.26 705	9.94 431	36		
25	9.67 750	24	9.73 326	31	0.26 674	9.94 424	35		
26	9.67 773	23	9.73 356	30	0.26 644	9.94 417	34		
27	9.67 796	24	9.73 386	30	0.26 614	9.94 410	33	24	23
28	9.67 820	24	9.73 416	30	0.26 584	9.94 404	32	1	2.4
29	9.67 843	23	9.73 446	30	0.26 554	9.94 397	31	2	4.8
30	9.67 866	24	9.73 476	31	0.26 524	9.94 390	30	3	6.9
31	9.67 890	23	9.73 507	30	0.26 493	9.94 383	29	4	9.6
32	9.67 913	23	9.73 537	30	0.26 463	9.94 376	28	5	12.0
33	9.67 936	23	9.73 567	30	0.26 433	9.94 369	27	6	14.4
34	9.67 959	23	9.73 597	30	0.26 403	9.94 362	26	7	13.8
35	9.67 982	23	9.73 627	30	0.26 373	9.94 355	25	8	16.8
36	9.68 006	24	9.73 657	30	0.26 343	9.94 349	24	9	16.1
37	9.68 029	23	9.73 687	30	0.26 313	9.94 342	23		
38	9.68 052	23	9.73 717	30	0.26 283	9.94 335	22		
39	9.68 075	23	9.73 747	30	0.26 253	9.94 328	21		
40	9.68 098	23	9.73 777	30	0.26 223	9.94 321	20		
41	9.68 121	23	9.73 807	30	0.26 193	9.94 314	19		
42	9.68 144	23	9.73 837	30	0.26 163	9.94 307	18		
43	9.68 167	23	9.73 867	30	0.26 133	9.94 300	17		
44	9.68 190	23	9.73 897	30	0.26 103	9.94 293	16	7	6
45	9.68 213	23	9.73 927	30	0.26 073	9.94 286	15	1	0.7
46	9.68 237	24	9.73 957	30	0.26 043	9.94 279	14	2	1.4
47	9.68 260	23	9.73 987	30	0.26 013	9.94 273	13	3	2.1
48	9.68 283	23	9.74 017	30	0.25 983	9.94 266	12	4	2.8
49	9.68 305	22	9.74 047	30	0.25 953	9.94 259	11	5	3.5
50	9.68 328	23	9.74 077	30	0.25 923	9.94 252	10	6	3.0
51	9.68 351	23	9.74 107	30	0.25 893	9.94 245	9	7	4.2
52	9.68 374	23	9.74 137	30	0.25 863	9.94 238	8	8	4.9
53	9.68 397	23	9.74 166	29	0.25 834	9.94 231	7	9	5.6
54	9.68 420	23	9.74 196	30	0.25 804	9.94 224	6		
55	9.68 443	23	9.74 226	30	0.25 774	9.94 217	5		
56	9.68 466	23	9.74 256	30	0.25 744	9.94 210	4		
57	9.68 489	23	9.74 286	30	0.25 714	9.94 203	3		
58	9.68 512	23	9.74 316	30	0.25 684	9.94 196	2		
59	9.68 534	22	9.74 345	29	0.25 655	9.94 189	1		
60	9.68 557	23	9.74 375	30	0.25 625	9.94 182	0		
	L Cos	d	L Cot	c d	L Tan	L Sin	d	1	P P

/	L Sin	d	L Tan	c d	L Cot	L Cos	d		P P
0	9.68 557	23	9.74 375	30	0.25 625	9.94 182	7	60	
1	9.68 580	23	9.74 405	30	0.25 595	9.94 175	7	59	
2	9.68 603	23	9.74 435	30	0.25 565	9.94 168	7	58	
3	9.68 625	23	9.74 465	30	0.25 535	9.94 161	7	57	
4	9.68 648	23	9.74 494	30	0.25 506	9.94 154	7	56	
5	9.68 671	23	9.74 524	30	0.25 476	9.94 147	7	55	
6	9.68 694	23	9.74 554	30	0.25 446	9.94 140	7	54	
7	9.68 716	23	9.74 583	30	0.25 417	9.94 133	7	53	
8	9.68 739	23	9.74 613	30	0.25 387	9.94 126	7	52	
9	9.68 762	23	9.74 643	30	0.25 357	9.94 119	7	51	
10	9.68 784	23	9.74 673	30	0.25 327	9.94 112	7	50	
11	9.68 807	23	9.74 702	30	0.25 298	9.94 105	7	49	
12	9.68 829	22	9.74 732	30	0.25 268	9.94 098	7	48	
13	9.68 852	23	9.74 762	30	0.25 238	9.94 090	8	47	
14	9.68 875	23	9.74 791	29	0.25 209	9.94 083	7	46	
15	9.68 897	22	9.74 821	30	0.25 179	9.94 076	7	45	
16	9.68 920	23	9.74 851	30	0.25 149	9.94 069	7	44	
17	9.68 942	23	9.74 880	30	0.25 120	9.94 062	7	43	
18	9.68 965	23	9.74 910	30	0.25 090	9.94 055	7	42	
19	9.68 987	23	9.74 939	30	0.25 061	9.94 048	7	41	
20	9.69 010	22	9.74 969	29	0.25 031	9.94 041	7	40	
21	9.69 032	23	9.74 998	30	0.25 002	9.94 034	7	39	
22	9.69 055	23	9.75 028	30	0.24 972	9.94 027	7	38	
23	9.69 077	22	9.75 058	30	0.24 942	9.94 020	8	37	
24	9.69 100	23	9.75 087	29	0.24 913	9.94 012	7	36	
25	9.69 122	22	9.75 117	30	0.24 883	9.94 005	7	35	
26	9.69 144	22	9.75 146	29	0.24 854	9.93 998	7	34	
27	9.69 167	23	9.75 176	30	0.24 824	9.93 991	7	33	
28	9.69 189	22	9.75 205	29	0.24 795	9.93 984	7	32	
29	9.69 212	23	9.75 235	30	0.24 765	9.93 977	7	31	
30	9.69 234	22	9.75 264	30	0.24 736	9.93 970	7	30	
31	9.69 256	23	9.75 294	29	0.24 706	9.93 963	7	29	
32	9.69 279	23	9.75 323	29	0.24 677	9.93 955	8	28	
33	9.69 301	22	9.75 353	29	0.24 647	9.93 948	7	27	
34	9.69 323	22	9.75 382	29	0.24 618	9.93 941	7	26	
35	9.69 345	23	9.75 411	29	0.24 589	9.93 934	7	25	
36	9.69 368	23	9.75 441	30	0.24 559	9.93 927	7	24	
37	9.69 390	22	9.75 470	29	0.24 530	9.93 920	8	23	
38	9.69 412	22	9.75 500	30	0.24 500	9.93 912	7	22	
39	9.69 434	22	9.75 529	29	0.24 471	9.93 905	7	21	
40	9.69 456	23	9.75 558	30	0.24 442	9.93 898	7	20	
41	9.69 479	22	9.75 588	30	0.24 412	9.93 891	7	19	
42	9.69 501	23	9.75 617	29	0.24 383	9.93 884	8	18	
43	9.69 523	22	9.75 647	30	0.24 353	9.93 876	7	17	
44	9.69 545	22	9.75 676	29	0.24 324	9.93 869	7	16	
45	9.69 567	22	9.75 705	29	0.24 295	9.93 862	7	15	
46	9.69 589	22	9.75 735	30	0.24 265	9.93 855	8	14	
47	9.69 611	22	9.75 764	29	0.24 236	9.93 847	7	13	
48	9.69 633	22	9.75 793	29	0.24 207	9.93 840	7	12	
49	9.69 655	22	9.75 822	29	0.24 178	9.93 833	7	11	
50	9.69 677	22	9.75 852	30	0.24 148	9.93 826	7	10	
51	9.69 699	22	9.75 881	29	0.24 119	9.93 819	8	9	
52	9.69 721	22	9.75 910	29	0.24 090	9.93 811	7	8	
53	9.69 743	22	9.75 939	29	0.24 061	9.93 804	7	7	
54	9.69 765	22	9.75 969	30	0.24 031	9.93 797	8	6	
55	9.69 787	22	9.75 998	29	0.24 002	9.93 789	8	5	
56	9.69 809	22	9.76 027	29	0.23 973	9.93 782	7	4	
57	9.69 831	22	9.76 056	30	0.23 944	9.93 775	7	3	
58	9.69 853	22	9.76 086	30	0.23 914	9.93 768	8	2	
59	9.69 875	22	9.76 115	29	0.23 885	9.93 760	7	1	
60	9.69 897		9.76 144		0.23 856	9.93 753		0	
	L Cos	d	L Cot	c d	L Tan	L Sin	d	/	P P

/	L Sin	d	L Tan	c d	L Cot	L Cos	d	P P		
O	9.69 897	22	9.76 144	29	0.23 856	9.93 753	7	60		
1	9.69 919	22	9.76 173	29	0.23 827	9.93 746	8	59		
2	9.69 941	22	9.76 202	29	0.23 798	9.93 738	8	58		
3	9.69 963	22	9.76 231	29	0.23 769	9.93 731	7	57		
4	9.69 984	22	9.76 261	29	0.23 739	9.93 724	7	56		
5	9.70 006	22	9.76 290	29	0.23 710	9.93 717	7	55		
6	9.70 028	22	9.76 319	29	0.23 681	9.93 709	8	54		
7	9.70 050	22	9.76 348	29	0.23 652	9.93 702	7	53		
8	9.70 072	22	9.76 377	29	0.23 623	9.93 695	7	52		
9	9.70 093	22	9.76 406	29	0.23 594	9.93 687	8	51		
10	9.70 115	22	9.76 435	29	0.23 565	9.93 680	7	50	30	29
11	9.70 137	22	9.76 464	29	0.23 536	9.93 673	8	49	1 3.0	2.9
12	9.70 159	22	9.76 493	29	0.23 507	9.93 665	8	48	2 6.0	5.8
13	9.70 180	21	9.76 522	29	0.23 478	9.93 658	7	47	3 9.0	8.7
14	9.70 202	22	9.76 551	29	0.23 449	9.93 650	8	46	4 12.0	11.6
15	9.70 224	22	9.76 580	29	0.23 420	9.93 643	7	45	5 15.0	14.5
16	9.70 245	21	9.76 609	29	0.23 391	9.93 636	7	44	6 18.0	16.8
17	9.70 267	22	9.76 639	30	0.23 361	9.93 628	8	43	7 21.0	20.3
18	9.70 288	21	9.76 668	29	0.23 332	9.93 621	7	42	8 24.0	23.2
19	9.70 310	22	9.76 697	28	0.23 303	9.93 614	8	41	9 27.0	26.1
20	9.70 332	21	9.76 725	29	0.23 275	9.93 606	7	40		
21	9.70 353	22	9.76 754	29	0.23 246	9.93 599	8	39		
22	9.70 375	21	9.76 783	29	0.23 217	9.93 591	7	38		
23	9.70 396	22	9.76 812	29	0.23 188	9.93 584	7	37		
24	9.70 418	21	9.76 841	29	0.23 159	9.93 577	8	36		
25	9.70 439	21	9.76 870	29	0.23 130	9.93 569	8	35		
26	9.70 461	21	9.76 899	29	0.23 101	9.93 562	7	34		
27	9.70 482	22	9.76 928	29	0.23 072	9.93 554	8	33		
28	9.70 504	22	9.76 957	29	0.23 043	9.93 547	7	32		
29	9.70 525	21	9.76 986	29	0.23 014	9.93 539	7	31		
30	9.70 547	21	9.77 015	29	0.22 985	9.93 532	7	30	22	21
31	9.70 568	22	9.77 044	29	0.22 956	9.93 525	8	29	1 2.2	2.1
32	9.70 590	22	9.77 073	28	0.22 927	9.93 517	8	28	2 4.4	4.2
33	9.70 611	21	9.77 101	29	0.22 899	9.93 510	7	27	3 6.0	6.3
34	9.70 633	22	9.77 130	29	0.22 870	9.93 502	8	26	4 8.8	8.4
35	9.70 654	21	9.77 159	29	0.22 841	9.93 495	7	25	5 11.0	10.5
36	9.70 675	21	9.77 188	29	0.22 812	9.93 487	8	24	6 13.2	12.6
37	9.70 697	22	9.77 217	29	0.22 783	9.93 480	7	23	7 15.4	14.7
38	9.70 718	21	9.77 246	29	0.22 754	9.93 472	8	22	8 17.6	16.8
39	9.70 739	22	9.77 274	28	0.22 726	9.93 465	8	21	9 19.8	18.9
40	9.70 761	21	9.77 303	29	0.22 697	9.93 457	7	20		
41	9.70 782	21	9.77 332	29	0.22 668	9.93 450	8	19		
42	9.70 803	21	9.77 361	29	0.22 639	9.93 442	7	18		
43	9.70 824	22	9.77 390	28	0.22 610	9.93 435	8	17		
44	9.70 846	21	9.77 418	29	0.22 582	9.93 427	7	16		
45	9.70 867	21	9.77 447	29	0.22 553	9.93 420	8	15	1 0.8	0.7
46	9.70 888	21	9.77 476	29	0.22 524	9.93 412	7	14	2 1.6	1.4
47	9.70 909	22	9.77 505	28	0.22 495	9.93 405	8	13	3 2.4	2.1
48	9.70 931	21	9.77 533	29	0.22 467	9.93 397	7	12	4 3.2	2.8
49	9.70 952	21	9.77 562	29	0.22 438	9.93 390	8	11	5 4.0	3.5
50	9.70 973	21	9.77 591	28	0.22 409	9.93 382	7	10	6 4.8	4.2
51	9.70 994	21	9.77 619	29	0.22 381	9.93 375	8	9	7 5.6	4.9
52	9.71 015	21	9.77 648	29	0.22 352	9.93 367	7	8	8 6.4	5.6
53	9.71 036	22	9.77 677	29	0.22 323	9.93 360	8	7	9 7.2	6.3
54	9.71 058	21	9.77 706	28	0.22 294	9.93 352	8	6		
55	9.71 079	21	9.77 734	29	0.22 266	9.93 344	7	5		
56	9.71 100	21	9.77 763	28	0.22 237	9.93 337	8	4		
57	9.71 121	21	9.77 791	29	0.22 209	9.93 329	7	3		
58	9.71 142	21	9.77 820	29	0.22 180	9.93 322	7	2		
59	9.71 163	21	9.77 849	28	0.22 151	9.93 314	8	1		
60	9.71 184		9.77 877		0.22 123	9.93 307	7	O		
	L Cos	d	L Cot	c d	L Tan	L Sin	d	/	P P	

/	L Sin	d	L Tan	cd	L Cot	L Cos	d		PP
0	9.71 184	21	9.77 877	29	0.22 123	9.93 307	8	60	
1	9.71 205	21	9.77 906	29	0.22 094	9.93 299	8	59	
2	9.71 226	21	9.77 935	28	0.22 065	9.93 291	8	58	
3	9.71 247	21	9.77 963	29	0.22 037	9.93 284	7	57	
4	9.71 268	21	9.77 992	28	0.22 008	9.93 276	8	56	
5	9.71 289	21	9.78 020	29	0.21 980	9.93 269	7	55	
6	9.71 310	21	9.78 049	28	0.21 951	9.93 261	8	54	
7	9.71 331	21	9.78 077	29	0.21 923	9.93 253		53	
8	9.71 352	21	9.78 106	29	0.21 894	9.93 246	7	52	
9	9.71 373	20	9.78 135	28	0.21 865	9.93 238	8	51	
10	9.71 393	21	9.78 163	29	0.21 837	9.93 230	7	50	
11	9.71 414	21	9.78 192	28	0.21 808	9.93 223	8	49	
12	9.71 435	21	9.78 220	29	0.21 780	9.93 215	8	48	
13	9.71 456	21	9.78 249	28	0.21 751	9.93 207	8	47	
14	9.71 477	21	9.78 277	29	0.21 723	9.93 200	7	46	
15	9.71 498	21	9.78 306	29	0.21 694	9.93 192	8	45	
16	9.71 519	21	9.78 334	28	0.21 666	9.93 184	8	44	
17	9.71 539	20	9.78 363	29	0.21 637	9.93 177	7	43	
18	9.71 560	21	9.78 391	28	0.21 609	9.93 169	8	42	
19	9.71 581	21	9.78 419	29	0.21 581	9.93 161		41	
20	9.71 602	20	9.78 448	28	0.21 552	9.93 154	8	40	
21	9.71 622	21	9.78 476	29	0.21 524	9.93 146	8	39	
22	9.71 643	21	9.78 505	28	0.21 495	9.93 138	7	38	
23	9.71 664	21	9.78 533	29	0.21 467	9.93 131		37	
24	9.71 685	20	9.78 562	28	0.21 438	9.93 123	8	36	
25	9.71 705	20	9.78 590	28	0.21 410	9.93 115	8	35	
26	9.71 726	21	9.78 618	28	0.21 382	9.93 108	7	34	
27	9.71 747	20	9.78 647	28	0.21 353	9.93 100	8	33	
28	9.71 767	20	9.78 675	28	0.21 325	9.93 092	8	32	
29	9.71 788	21	9.78 704	28	0.21 296	9.93 084	7	31	
30	9.71 809	20	9.78 732	28	0.21 268	9.93 077	8	30	
31	9.71 829	21	9.78 760	29	0.21 240	9.93 069	8	29	
32	9.71 850	20	9.78 789	28	0.21 211	9.93 061	8	28	
33	9.71 870	21	9.78 817	28	0.21 183	9.93 053	7	27	
34	9.71 891	20	9.78 845	29	0.21 155	9.93 046		26	
35	9.71 911	21	9.78 874	28	0.21 126	9.93 038	8	25	
36	9.71 932	20	9.78 902	28	0.21 098	9.93 030	8	24	
37	9.71 952	21	9.78 930	29	0.21 070	9.93 022		23	
38	9.71 973	21	9.78 959	29	0.21 041	9.93 014	7	22	
39	9.71 994	20	9.78 987	28	0.21 013	9.93 007	8	21	
40	9.72 014	20	9.79 015	28	0.20 985	9.92 999	8	20	
41	9.72 034	21	9.79 043	29	0.20 957	9.92 991	8	19	
42	9.72 055	20	9.79 072	28	0.20 928	9.92 983	7	18	
43	9.72 075	21	9.79 100	28	0.20 900	9.92 976		17	
44	9.72 096	20	9.79 128	28	0.20 872	9.92 968	8	16	
45	9.72 116	21	9.79 156	28	0.20 844	9.92 960	8	15	
46	9.72 137	20	9.79 185	28	0.20 815	9.92 952	8	14	
47	9.72 157	20	9.79 213	28	0.20 787	9.92 944	8	13	
48	9.72 177	21	9.79 241	28	0.20 759	9.92 936	7	12	
49	9.72 198	20	9.79 269	28	0.20 731	9.92 929	8	11	
50	9.72 218	20	9.79 297	29	0.20 703	9.92 921	8	10	
51	9.72 238	21	9.79 326	28	0.20 674	9.92 913	8	9	
52	9.72 259	20	9.79 354	28	0.20 646	9.92 905	8	8	
53	9.72 279	20	9.79 382	28	0.20 618	9.92 897	8	7	
54	9.72 299	21	9.79 410	28	0.20 590	9.92 889		6	
55	9.72 320	20	9.79 438	28	0.20 562	9.92 881	8	5	
56	9.72 340	20	9.79 466	29	0.20 534	9.92 874	7	4	
57	9.72 360	21	9.79 495	28	0.20 505	9.92 866		3	
58	9.72 381	20	9.79 523	28	0.20 477	9.92 858	8	2	
59	9.72 401	20	9.79 551	28	0.20 449	9.92 850	8	1	
60	9.72 421		9.79 579		0.20 421	9.92 842		0	
	L Cos	d	L Cot	cd	L Tan	L Sin	d	/	PP

/	L Sin	d	L Tan	cd	L Cot	L Cos	d	P P		
0	9.72 421	20	9.79 579	28	0.20 421	9.92 842	8	60		
1	9.72 441	20	9.79 607	28	0.20 393	9.92 834	8	59		
2	9.72 461	20	9.79 635	28	0.20 365	9.92 826	8	58		
3	9.72 482	21	9.79 663	28	0.20 337	9.92 818	8	57		
4	9.72 502	20	9.79 691	28	0.20 309	9.92 810	7	56		
5	9.72 522	20	9.79 719	28	0.20 281	9.92 803	8	55		
6	9.72 542	20	9.79 747	29	0.20 253	9.92 795	8	54		
7	9.72 562	20	9.79 776	28	0.20 224	9.92 787	8	53		
8	9.72 582	20	9.79 804	28	0.20 196	9.92 779	8	52		
9	9.72 602	20	9.79 832	28	0.20 168	9.92 771	8	51		
10	9.72 622	21	9.79 860	28	0.20 140	9.92 763	8	50	29	28
11	9.72 643	20	9.79 888	28	0.20 112	9.92 755	8	49	I 2.0	2.8
12	9.72 663	20	9.79 916	28	0.20 084	9.92 747	8	48	2 5.8	5.6
13	9.72 683	20	9.79 944	28	0.20 056	9.92 739	8	47	3 8.7	8.1
14	9.72 703	20	9.79 972	28	0.20 028	9.92 731	8	46	4 11.6	10.8
15	9.72 723	20	9.80 000	28	0.20 000	9.92 723	8	45	5 14.5	14.0
16	9.72 743	20	9.80 028	28	0.19 972	9.92 715	8	44	6 17.4	16.8
17	9.72 763	20	9.80 056	28	0.19 944	9.92 707	8	43	7 20.3	19.6
18	9.72 783	20	9.80 084	28	0.19 916	9.92 699	8	42	8 23.2	22.4
19	9.72 803	20	9.80 112	28	0.19 888	9.92 691	8	41	9 26.1	25.2
20	9.72 823	20	9.80 140	28	0.19 860	9.92 683	8	40		
21	9.72 843	20	9.80 168	28	0.19 832	9.92 675	8	39		
22	9.72 863	20	9.80 195	27	0.19 805	9.92 667	8	38		
23	9.72 883	20	9.80 223	28	0.19 777	9.92 659	8	37		
24	9.72 902	20	9.80 251	28	0.19 749	9.92 651	8	36		
25	9.72 922	20	9.80 279	28	0.19 721	9.92 643	8	35		
26	9.72 942	20	9.80 307	28	0.19 693	9.92 635	8	34		
27	9.72 962	20	9.80 335	28	0.19 665	9.92 627	8	33		
28	9.72 982	20	9.80 363	28	0.19 637	9.92 619	8	32	I 2.1	2.0
29	9.73 002	20	9.80 391	28	0.19 609	9.92 611	8	31	2 4.2	4.0
30	9.73 022	19	9.80 419	28	0.19 581	9.92 603	8	30	3 6.3	6.0
31	9.73 041	20	9.80 447	27	0.19 553	9.92 595	8	29	4 8.4	8.0
32	9.73 061	20	9.80 474	28	0.19 526	9.92 587	8	28	5 10.5	10.0
33	9.73 081	20	9.80 502	28	0.19 498	9.92 579	8	27	6 12.6	12.0
34	9.73 101	20	9.80 530	28	0.19 470	9.92 571	8	26	7 14.7	14.0
35	9.73 121	19	9.80 558	28	0.19 442	9.92 563	8	25	8 16.8	16.0
36	9.73 140	20	9.80 586	28	0.19 414	9.92 555	9	24	9 18.9	18.0
37	9.73 160	20	9.80 614	28	0.19 386	9.92 546	8	23		
38	9.73 180	20	9.80 642	28	0.19 358	9.92 538	8	22		
39	9.73 200	19	9.80 669	27	0.19 331	9.92 530	8	21		
40	9.73 219	20	9.80 697	28	0.19 303	9.92 522	8	20		
41	9.73 239	20	9.80 725	28	0.19 275	9.92 514	8	19		
42	9.73 259	19	9.80 753	28	0.19 247	9.92 506	8	18		
43	9.73 278	20	9.80 781	27	0.19 219	9.92 498	8	17		
44	9.73 298	20	9.80 808	28	0.19 192	9.92 490	8	16		
45	9.73 318	19	9.80 836	28	0.19 164	9.92 482	9	15	I 0.9	0.8
46	9.73 337	20	9.80 864	28	0.19 136	9.92 473	8	14	2 1.8	1.6
47	9.73 357	20	9.80 892	27	0.19 108	9.92 465	8	13	3 2.7	2.4
48	9.73 377	19	9.80 919	28	0.19 081	9.92 457	8	12	4 3.6	3.2
49	9.73 396	20	9.80 947	28	0.19 053	9.92 449	8	11	5 4.5	4.0
50	9.73 416	19	9.80 975	28	0.19 025	9.92 441	8	10	6 5.4	4.8
51	9.73 435	20	9.81 003	27	0.18 997	9.92 433	8	9	7 6.3	5.6
52	9.73 455	19	9.81 030	28	0.18 970	9.92 425	9	8		
53	9.73 474	20	9.81 058	28	0.18 942	9.92 416	8	7		
54	9.73 494	19	9.81 086	27	0.18 914	9.92 408	8	6		
55	9.73 513	20	9.81 113	28	0.18 887	9.92 400	8	5		
56	9.73 533	19	9.81 141	28	0.18 859	9.92 392	8	4		
57	9.73 552	20	9.81 169	27	0.18 831	9.92 384	8	3		
58	9.73 572	19	9.81 196	28	0.18 804	9.92 376	9	2		
59	9.73 591	20	9.81 224	28	0.18 776	9.92 367	8	1		
60	9.73 611		9.81 252		0.18 748	9.92 359		O		
	L Cos	d	L Cot	cd	L Tan	L Sin	d	/	P P	

I	L Sin	d	L Tan	cd	L Cot	L Cos	d	P P
0	9.73 611	19	9.81 252	27	0.18 748	9.92 359	8	60
1	9.73 630	20	9.81 279	28	0.18 721	9.92 351	8	59
2	9.73 650	19	9.81 307	28	0.18 693	9.92 343	8	58
3	9.73 669	20	9.81 335	27	0.18 665	9.92 335	8	57
4	9.73 689	19	9.81 362	27	0.18 638	9.92 326	9	56
5	9.73 708	19	9.81 390	28	0.18 610	9.92 318	8	55
6	9.73 727	19	9.81 418	28	0.18 582	9.92 310	8	54
7	9.73 747	20	9.81 445	27	0.18 555	9.92 302	8	53
8	9.73 766	19	9.81 473	28	0.18 527	9.92 293	9	52
9	9.73 785	20	9.81 500	27	0.18 500	9.92 285	8	51
10	9.73 805	19	9.81 528	28	0.18 472	9.92 277	8	50
11	9.73 824	19	9.81 556	27	0.18 444	9.92 269	9	49
12	9.73 843	20	9.81 583	28	0.18 417	9.92 260	8	48
13	9.73 863	19	9.81 611	28	0.18 389	9.92 252	8	47
14	9.73 882	19	9.81 638	28	0.18 362	9.92 244	9	46
15	9.73 901	19	9.81 666	28	0.18 334	9.92 235	8	45
16	9.73 921	19	9.81 693	27	0.18 307	9.92 227	8	44
17	9.73 940	19	9.81 721	27	0.18 279	9.92 219	8	43
18	9.73 959	19	9.81 748	27	0.18 252	9.92 211	8	42
19	9.73 978	19	9.81 776	27	0.18 224	9.92 202	8	41
20	9.73 997	20	9.81 803	28	0.18 197	9.92 194	8	40
21	9.74 017	19	9.81 831	27	0.18 169	9.92 186	9	39
22	9.74 036	19	9.81 858	27	0.18 142	9.92 177	8	38
23	9.74 055	19	9.81 886	28	0.18 114	9.92 169	8	37
24	9.74 074	19	9.81 913	28	0.18 087	9.92 161	9	36
25	9.74 093	19	9.81 941	28	0.18 059	9.92 152	8	35
26	9.74 113	19	9.81 968	27	0.18 032	9.92 144	8	34
27	9.74 132	19	9.81 996	27	0.18 004	9.92 136	9	33
28	9.74 151	19	9.82 023	27	0.17 977	9.92 127	9	32
29	9.74 170	19	9.82 051	28	0.17 949	9.92 119	8	31
30	9.74 189	19	9.82 078	28	0.17 922	9.92 111	9	30
31	9.74 208	19	9.82 106	27	0.17 894	9.92 102	8	29
32	9.74 227	19	9.82 133	28	0.17 867	9.92 094	8	28
33	9.74 246	19	9.82 161	27	0.17 839	9.92 086	9	27
34	9.74 265	19	9.82 188	27	0.17 812	9.92 077	8	26
35	9.74 284	19	9.82 215	28	0.17 785	9.92 069	9	25
36	9.74 303	19	9.82 243	27	0.17 757	9.92 060	8	24
37	9.74 322	19	9.82 270	28	0.17 730	9.92 052	8	23
38	9.74 341	19	9.82 298	28	0.17 702	9.92 044	9	22
39	9.74 360	19	9.82 325	27	0.17 675	9.92 035	8	21
40	9.74 379	19	9.82 352	28	0.17 648	9.92 027	9	20
41	9.74 398	19	9.82 380	27	0.17 620	9.92 018	8	19
42	9.74 417	19	9.82 407	28	0.17 593	9.92 010	8	18
43	9.74 436	19	9.82 435	27	0.17 565	9.92 002	9	17
44	9.74 455	19	9.82 462	27	0.17 538	9.91 993	8	16
45	9.74 474	19	9.82 489	28	0.17 511	9.91 985	9	15
46	9.74 493	19	9.82 517	27	0.17 483	9.91 976	8	14
47	9.74 512	19	9.82 544	27	0.17 456	9.91 968	9	13
48	9.74 531	18	9.82 571	28	0.17 429	9.91 959	8	12
49	9.74 549	19	9.82 599	27	0.17 401	9.91 951	9	11
50	9.74 568	19	9.82 626	27	0.17 374	9.91 942	8	10
51	9.74 587	19	9.82 653	28	0.17 347	9.91 934	9	9
52	9.74 606	19	9.82 681	27	0.17 319	9.91 925	8	8
53	9.74 625	19	9.82 708	27	0.17 292	9.91 917	9	7
54	9.74 644	18	9.82 735	27	0.17 265	9.91 908	8	6
55	9.74 662	19	9.82 762	28	0.17 238	9.91 900	9	5
56	9.74 681	19	9.82 790	27	0.17 210	9.91 891	8	4
57	9.74 700	19	9.82 817	27	0.17 183	9.91 883	9	3
58	9.74 719	18	9.82 844	27	0.17 156	9.91 874	8	2
59	9.74 737	19	9.82 871	28	0.17 129	9.91 866	9	1
60	9.74 756	19	9.82 899	27	0.17 101	9.91 857	9	O

L Cos

d

L Cot

cd

L Tan

L Sin

d

I

P P

34°

/	L Sin	d	L Tan	cd	L Cot	L Cos	d	P P		
O	9.74 756	10	9.82 899	27	0.17 101	9.91 857	8	60		
1	9.74 775	10	9.82 926	27	0.17 074	9.91 849	9	59		
2	9.74 794	10	9.82 953	27	0.17 047	9.91 840	9	58		
3	9.74 812	10	9.82 980	28	0.17 020	9.91 832	9	57		
4	9.74 831	10	9.83 008	27	0.16 992	9.91 823	8	56		
5	9.74 850	10	9.83 035	27	0.16 965	9.91 815	9	55		
6	9.74 868	10	9.83 062	27	0.16 938	9.91 806	9	54		
7	9.74 887	10	9.83 089	28	0.16 911	9.91 798	9	53		
8	9.74 906	10	9.83 117	27	0.16 883	9.91 789	9	52		
9	9.74 924	10	9.83 144	27	0.16 856	9.91 781	9	51		
10	9.74 943	10	9.83 171	27	0.16 829	9.91 772	9	50		
11	9.74 961	10	9.83 198	27	0.16 802	9.91 763	8	49		
12	9.74 980	10	9.83 225	27	0.16 775	9.91 755	9	48		
13	9.74 999	10	9.83 252	28	0.16 748	9.91 746	8	47		
14	9.75 017	10	9.83 280	27	0.16 720	9.91 738	8	46		
15	9.75 036	10	9.83 307	27	0.16 693	9.91 729	9	45		
16	9.75 054	10	9.83 334	27	0.16 666	9.91 720	9	44		
17	9.75 073	10	9.83 361	27	0.16 639	9.91 712	9	43		
18	9.75 091	10	9.83 388	27	0.16 612	9.91 703	9	42		
19	9.75 110	10	9.83 415	27	0.16 585	9.91 695	9	41		
20	9.75 128	10	9.83 442	28	0.16 558	9.91 686	9	40		
21	9.75 147	10	9.83 470	27	0.16 530	9.91 677	8	39		
22	9.75 165	10	9.83 497	27	0.16 503	9.91 669	9	38		
23	9.75 184	10	9.83 524	27	0.16 476	9.91 660	9	37		
24	9.75 202	10	9.83 551	27	0.16 449	9.91 651	8	36		
25	9.75 221	10	9.83 578	27	0.16 422	9.91 643	9	35		
26	9.75 239	10	9.83 605	27	0.16 395	9.91 634	9	34		
27	9.75 258	10	9.83 632	27	0.16 368	9.91 625	8	33		
28	9.75 276	10	9.83 659	27	0.16 341	9.91 617	9	32		
29	9.75 294	10	9.83 686	27	0.16 314	9.91 608	9	31		
30	9.75 313	10	9.83 713	27	0.16 287	9.91 599	8	30		
31	9.75 331	10	9.83 740	28	0.16 260	9.91 591	9	29		
32	9.75 350	10	9.83 768	27	0.16 232	9.91 582	9	28		
33	9.75 368	10	9.83 795	27	0.16 205	9.91 573	8	27		
34	9.75 386	10	9.83 822	27	0.16 178	9.91 565	8	26		
35	9.75 405	10	9.83 849	27	0.16 151	9.91 556	9	25		
36	9.75 423	10	9.83 876	27	0.16 124	9.91 547	9	24		
37	9.75 441	10	9.83 903	27	0.16 097	9.91 538	8	23		
38	9.75 459	10	9.83 930	27	0.16 070	9.91 530	9	22		
39	9.75 478	10	9.83 957	27	0.16 043	9.91 521	9	21		
40	9.75 496	10	9.83 984	27	0.16 016	9.91 512	8	20		
41	9.75 514	10	9.84 011	27	0.15 980	9.91 504	9	19		
42	9.75 533	10	9.84 038	27	0.15 962	9.91 495	9	18		
43	9.75 551	10	9.84 065	27	0.15 935	9.91 486	9	17		
44	9.75 569	10	9.84 092	27	0.15 908	9.91 477	8	16		
45	9.75 587	10	9.84 119	27	0.15 881	9.91 469	9	15		
46	9.75 605	10	9.84 146	27	0.15 854	9.91 460	9	14		
47	9.75 624	10	9.84 173	27	0.15 827	9.91 451	9	13		
48	9.75 642	10	9.84 200	27	0.15 800	9.91 442	9	12		
49	9.75 660	10	9.84 227	27	0.15 773	9.91 433	8	11		
50	9.75 678	10	9.84 254	26	0.15 746	9.91 425	9	10		
51	9.75 696	10	9.84 280	27	0.15 720	9.91 416	9	9		
52	9.75 714	10	9.84 307	27	0.15 693	9.91 407	9	8		
53	9.75 733	10	9.84 334	27	0.15 666	9.91 398	9	7		
54	9.75 751	10	9.84 361	27	0.15 639	9.91 389	8	6		
55	9.75 769	10	9.84 388	27	0.15 612	9.91 381	9	5		
56	9.75 787	10	9.84 415	27	0.15 585	9.91 372	9	4		
57	9.75 805	10	9.84 442	27	0.15 558	9.91 363	9	3		
58	9.75 823	10	9.84 469	27	0.15 531	9.91 354	9	2		
59	9.75 841	10	9.84 496	27	0.15 504	9.91 345	9	1		
60	9.75 859	—	9.84 523	—	0.15 477	9.91 336	—	0		
	L Cos	d	L Cot	cd	L Tan	L Sin	d	/	P P	

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55°

/	L Sin	d	L Tan	c d	L Cot	L Cos	d		P P
0	9.75 859	18	9.84 523	27	0.15 477	9.91 336	8	60	
1	9.75 877	18	9.84 550	26	0.15 450	9.91 328	9	59	
2	9.75 895	18	9.84 570	26	0.15 424	9.91 319	9	58	
3	9.75 913	18	9.84 603	27	0.15 397	9.91 310	9	57	
4	9.75 931	18	9.84 630	27	0.15 370	9.91 301	9	56	
5	9.75 949	18	9.84 657	27	0.15 343	9.91 292	9	55	
6	9.75 967	18	9.84 684	27	0.15 316	9.91 283	9	54	
7	9.75 985	18	9.84 711	27	0.15 289	9.91 274	8	53	
8	9.76 003	18	9.84 738	27	0.15 262	9.91 266	9	52	
9	9.76 021	18	9.84 764	27	0.15 236	9.91 257	9	51	
10	9.76 039	18	9.84 791	27	0.15 209	9.91 248	50	27	26
11	9.76 057	18	9.84 818	27	0.15 182	9.91 239	9	49	
12	9.76 075	18	9.84 845	27	0.15 155	9.91 229	9	48	
13	9.76 093	18	9.84 872	27	0.15 128	9.91 221	9	47	
14	9.76 111	18	9.84 899	26	0.15 101	9.91 212	9	46	
15	9.76 129	18	9.84 925	26	0.15 075	9.91 203	9	45	
16	9.76 146	18	9.84 952	27	0.15 048	9.91 194	9	44	
17	9.76 164	18	9.84 979	27	0.15 021	9.91 185	9	43	
18	9.76 182	18	9.85 006	27	0.14 994	9.91 176	9	42	
19	9.76 200	18	9.85 033	27	0.14 967	9.91 167	9	41	
20	9.76 218	18	9.85 059	27	0.14 941	9.91 158	40		
21	9.76 236	17	9.85 086	27	0.14 914	9.91 149	8	39	
22	9.76 253	17	9.85 113	27	0.14 887	9.91 141	9	38	
23	9.76 271	18	9.85 140	27	0.14 860	9.91 132	9	37	
24	9.76 289	18	9.85 166	26	0.14 834	9.91 123	9	36	
25	9.76 307	18	9.85 193	27	0.14 807	9.91 114	9	35	
26	9.76 324	18	9.85 220	27	0.14 780	9.91 105	9	34	
27	9.76 342	18	9.85 247	26	0.14 753	9.91 096	9	33	
28	9.76 360	18	9.85 273	26	0.14 727	9.91 087	9	32	
29	9.76 378	17	9.85 300	27	0.14 700	9.91 078	9	31	
30	9.76 395	18	9.85 327	27	0.14 673	9.91 069	30	18	17
31	9.76 413	18	9.85 354	26	0.14 646	9.91 060	9	29	
32	9.76 431	18	9.85 380	26	0.14 620	9.91 051	9	28	
33	9.76 448	18	9.85 407	27	0.14 593	9.91 042	9	27	
34	9.76 466	18	9.85 434	26	0.14 566	9.91 033	9	26	
35	9.76 484	17	9.85 460	26	0.14 540	9.91 023	10	25	
36	9.76 501	18	9.85 487	27	0.14 513	9.91 014	9	24	
37	9.76 519	18	9.85 514	26	0.14 486	9.91 005	9	23	
38	9.76 537	17	9.85 540	27	0.14 460	9.90 996	9	22	
39	9.76 554	18	9.85 567	27	0.14 433	9.90 987	9	21	
40	9.76 572	18	9.85 594	26	0.14 406	9.90 978	20		
41	9.76 590	17	9.85 620	27	0.14 380	9.90 969	9	19	
42	9.76 607	17	9.85 647	27	0.14 353	9.90 960	9	18	
43	9.76 625	17	9.85 674	26	0.14 326	9.90 951	9	17	
44	9.76 642	18	9.85 700	27	0.14 300	9.90 942	9	16	
45	9.76 660	18	9.85 727	27	0.14 273	9.90 933	9	15	
46	9.76 677	18	9.85 754	26	0.14 246	9.90 924	9	14	
47	9.76 695	17	9.85 780	27	0.14 220	9.90 915	9	13	
48	9.76 712	18	9.85 807	27	0.14 193	9.90 906	9	12	
49	9.76 730	17	9.85 834	26	0.14 166	9.90 896	10	11	
50	9.76 747	18	9.85 860	27	0.14 140	9.90 887	10	10	9
51	9.76 765	17	9.85 887	26	0.14 113	9.90 878	9	9	
52	9.76 782	18	9.85 913	27	0.14 087	9.90 869	9	8	
53	9.76 800	17	9.85 940	27	0.14 060	9.90 860	9	7	
54	9.76 817	18	9.85 967	26	0.14 033	9.90 851	9	6	
55	9.76 835	18	9.85 993	27	0.14 007	9.90 842	9	5	
56	9.76 852	18	9.86 020	27	0.13 980	9.90 832	10	4	
57	9.76 870	17	9.86 046	27	0.13 954	9.90 823	9	3	
58	9.76 887	17	9.86 073	27	0.13 927	9.90 814	9	2	
59	9.76 904	18	9.86 100	26	0.13 900	9.90 805	9	1	
60	9.76 922		9.86 126		0.13 874	9.90 796	0		
	L Cos	d	L Cot	c d	L Tan	L Sin	d	/	P P

I	L Sin	d	L Tan	cd	L Cot	L Cos	d	P P		
O	9.76 922	17	9.86 126	27	0.13 874	9.90 796	9	60		
1	9.76 939	18	9.86 153	26	0.13 847	9.90 787	10	59		
2	9.76 957	17	9.86 179	27	0.13 821	9.90 777	9	58		
3	9.76 974	17	9.86 206	27	0.13 794	9.90 768	9	57		
4	9.76 991	18	9.86 232	27	0.13 768	9.90 759	9	56		
5	9.77 009	18	9.86 259	26	0.13 741	9.90 750	9	55		
6	9.77 026	17	9.86 285	27	0.13 715	9.90 741	10	54		
7	9.77 043	18	9.86 312	26	0.13 688	9.90 731	9	53		
8	9.77 061	18	9.86 338	27	0.13 662	9.90 722	9	52		
9	9.77 078	17	9.86 365	27	0.13 635	9.90 713	9	51		
		17					9			
10	9.77 095	17	9.86 392	26	0.13 608	9.90 704	10	50		
11	9.77 112	18	9.86 418	27	0.13 582	9.90 694	9	49		
12	9.77 130	17	9.86 445	26	0.13 555	9.90 685	9	48		
13	9.77 147	17	9.86 471	27	0.13 529	9.90 676	9	47		
14	9.77 164	17	9.86 498	26	0.13 502	9.90 667	9	46		
15	9.77 181	17	9.86 524	27	0.13 476	9.90 657	10	45		
16	9.77 199	17	9.86 551	26	0.13 449	9.90 648	9	44		
17	9.77 216	17	9.86 577	26	0.13 423	9.90 639	9	43		
18	9.77 233	17	9.86 603	27	0.13 397	9.90 630	10	42		
19	9.77 250	18	9.86 630	26	0.13 370	9.90 620	9	41		
		18					9			
20	9.77 268	17	9.86 656	27	0.13 344	9.90 611	9	40		
21	9.77 285	17	9.86 683	26	0.13 317	9.90 602	10	39		
22	9.77 302	17	9.86 709	27	0.13 291	9.90 592	9	38		
23	9.77 319	17	9.86 736	26	0.13 264	9.90 583	9	37		
24	9.77 336	17	9.86 762	27	0.13 238	9.90 574	9	36		
25	9.77 353	17	9.86 789	27	0.13 211	9.90 565	10	35		
26	9.77 370	17	9.86 815	26	0.13 185	9.90 555	9	34		
27	9.77 387	18	9.86 842	26	0.13 158	9.90 546	9	33		
28	9.77 405	17	9.86 868	26	0.13 132	9.90 537	10	32	1	1.8
29	9.77 422	17	9.86 894	27	0.13 106	9.90 527	9	31	2	3.6
		17					9		3	3.4
							9		4	4.8
30	9.77 439	17	9.86 921	26	0.13 079	9.90 518	9	30	5	5.4
31	9.77 456	17	9.86 947	27	0.13 053	9.90 509	10	29	6	6.8
32	9.77 473	17	9.86 974	26	0.13 026	9.90 499	9	28	7	7.2
33	9.77 490	17	9.87 000	27	0.13 000	9.90 490	10	27	8	8.6
34	9.77 507	17	9.87 027	26	0.12 973	9.90 480	9	26	9	9.0
35	9.77 524	17	9.87 053	26	0.12 947	9.90 471	9	25	10	10.2
36	9.77 541	17	9.87 079	27	0.12 921	9.90 462	10	24	11	11.6
37	9.77 558	17	9.87 106	26	0.12 894	9.90 452	9	23	12	12.8
38	9.77 575	17	9.87 132	26	0.12 868	9.90 443	9	22	13	14.4
39	9.77 592	17	9.87 158	27	0.12 842	9.90 434	10	21	14	15.3
		17					9			
40	9.77 609	17	9.87 185	26	0.12 815	9.90 424	9	20		
41	9.77 626	17	9.87 211	27	0.12 789	9.90 415	10	19		
42	9.77 643	17	9.87 238	26	0.12 762	9.90 405	9	18		
43	9.77 660	17	9.87 264	26	0.12 736	9.90 396	10	17		
44	9.77 677	17	9.87 290	27	0.12 710	9.90 386	9	16		
45	9.77 694	17	9.87 317	27	0.12 683	9.90 377	9	15	1	1.0
46	9.77 711	17	9.87 343	26	0.12 657	9.90 368	10	14	2	2.0
47	9.77 728	16	9.87 369	27	0.12 631	9.90 358	9	13	3	3.0
48	9.77 744	17	9.87 396	26	0.12 604	9.90 349	10	12	4	4.0
49	9.77 761	17	9.87 422	26	0.12 578	9.90 339	9	11	5	5.0
		17					9		6	6.0
50	9.77 778	17	9.87 448	27	0.12 552	9.90 330	10	10	7	7.0
51	9.77 795	17	9.87 475	26	0.12 525	9.90 320	9	9	8	8.0
52	9.77 812	17	9.87 501	26	0.12 499	9.90 311	10	8		
53	9.77 829	17	9.87 527	27	0.12 473	9.90 301	9	7		
54	9.77 846	16	9.87 554	26	0.12 446	9.90 292	10	6		
55	9.77 862	17	9.87 580	26	0.12 420	9.90 282	9	5		
56	9.77 879	17	9.87 606	27	0.12 394	9.90 273	10	4		
57	9.77 896	17	9.87 633	26	0.12 367	9.90 263	9	3		
58	9.77 913	17	9.87 659	26	0.12 341	9.90 254	10	2		
59	9.77 930	16	9.87 685	26	0.12 315	9.90 244	9	1		
60	9.77 946		9.87 711		0.12 289	9.90 235		0		
	L Cos	d	L Cot	cd	L Tan	L Sin	d	I		P P

/	L Sin	d	L Tan	c d	L Cot	L Cos	d		P P
0	9.77 946	17	9.87 711	27	0.12 289	9.90 235	10	60	
1	9.77 963	17	9.87 738	26	0.12 262	9.90 225	9	59	
2	9.77 980	17	9.87 764	26	0.12 236	9.90 210	9	58	
3	9.77 997	16	9.87 790	27	0.12 210	9.90 206	10	57	
4	9.78 013	17	9.87 817	26	0.12 183	9.90 197	10	56	
5	9.78 030	17	9.87 843	26	0.12 157	9.90 187	10	55	
6	9.78 047	16	9.87 869	26	0.12 131	9.90 178	10	54	
7	9.78 063	17	9.87 895	26	0.12 105	9.90 168	9	53	
8	9.78 080	17	9.87 922	27	0.12 078	9.90 159	10	52	
9	9.78 097	17	9.87 948	26	0.12 052	9.90 149	10	51	
10	9.78 113	17	9.87 974	26	0.12 026	9.90 139	9	50	
11	9.78 130	17	9.88 000	27	0.12 000	9.90 130	10	49	
12	9.78 147	16	9.88 027	26	0.11 973	9.90 120	10	48	
13	9.78 163	17	9.88 053	26	0.11 947	9.90 111	9	47	
14	9.78 180	17	9.88 079	26	0.11 921	9.90 101	10	46	
15	9.78 197	17	9.88 105	26	0.11 895	9.90 091	10	45	
16	9.78 213	16	9.88 131	27	0.11 869	9.90 082	9	44	
17	9.78 230	16	9.88 158	26	0.11 842	9.90 072	9	43	
18	9.78 246	17	9.88 184	26	0.11 816	9.90 063	10	42	
19	9.78 263	17	9.88 210	26	0.11 790	9.90 053	10	41	
20	9.78 280	16	9.88 236	26	0.11 764	9.90 043	9	40	
21	9.78 296	17	9.88 262	27	0.11 738	9.90 034	10	39	
22	9.78 313	16	9.88 289	26	0.11 711	9.90 024	10	38	
23	9.78 329	17	9.88 315	26	0.11 685	9.90 014	10	37	
24	9.78 346	16	9.88 341	26	0.11 659	9.90 005	9	36	
25	9.78 362	17	9.88 367	26	0.11 633	9.89 995	10	35	
26	9.78 379	16	9.88 393	27	0.11 607	9.89 985	9	34	
27	9.78 395	17	9.88 420	26	0.11 580	9.89 976	10	33	
28	9.78 412	16	9.88 446	26	0.11 554	9.89 966	10	32	
29	9.78 428	17	9.88 472	26	0.11 528	9.89 956	9	31	
30	9.78 445	16	9.88 498	26	0.11 502	9.89 947	10	30	
31	9.78 461	17	9.88 524	26	0.11 476	9.89 937	10	29	
32	9.78 478	16	9.88 550	27	0.11 450	9.89 927	9	28	
33	9.78 494	16	9.88 577	26	0.11 423	9.89 918	10	27	
34	9.78 510	17	9.88 603	26	0.11 397	9.89 908	9	26	
35	9.78 527	16	9.88 629	26	0.11 371	9.89 898	10	25	
36	9.78 543	17	9.88 655	26	0.11 345	9.89 888	9	24	
37	9.78 560	16	9.88 681	26	0.11 319	9.89 879	10	23	
38	9.78 576	16	9.88 707	26	0.11 293	9.89 869	10	22	
39	9.78 592	17	9.88 733	26	0.11 267	9.89 859	10	21	
40	9.78 609	16	9.88 759	27	0.11 241	9.89 849	9	20	
41	9.78 625	17	9.88 786	26	0.11 214	9.89 840	10	19	
42	9.78 642	17	9.88 812	26	0.11 188	9.89 830	10	18	
43	9.78 658	16	9.88 838	26	0.11 162	9.89 820	10	17	
44	9.78 674	17	9.88 864	26	0.11 136	9.89 810	9	16	
45	9.78 691	16	9.88 890	26	0.11 110	9.89 801	10	15	
46	9.78 707	16	9.88 916	26	0.11 084	9.89 791	10	14	
47	9.78 723	16	9.88 942	26	0.11 058	9.89 781	10	13	
48	9.78 739	17	9.88 968	26	0.11 032	9.89 771	10	12	
49	9.78 756	16	9.88 994	26	0.11 006	9.89 761	9	11	
50	9.78 772	16	9.89 020	26	0.10 980	9.89 752	10	10	
51	9.78 788	17	9.89 046	27	0.10 954	9.89 742	10	9	
52	9.78 805	16	9.89 073	26	0.10 927	9.89 732	10	8	
53	9.78 821	16	9.89 099	26	0.10 901	9.89 722	10	7	
54	9.78 837	16	9.89 125	26	0.10 875	9.89 712	9	6	
55	9.78 853	16	9.89 151	26	0.10 849	9.89 702	10	5	
56	9.78 869	17	9.89 177	26	0.10 823	9.89 693	10	4	
57	9.78 886	16	9.89 203	26	0.10 797	9.89 683	10	3	
58	9.78 902	16	9.89 229	26	0.10 771	9.89 673	10	2	
59	9.78 918	16	9.89 255	26	0.10 745	9.89 663	10	1	
60	9.78 934		9.89 281		0.10 719	9.89 653		0	
	L Cos	d	L Cot	c d	L Tan	L Sin	d	/	P P

/	L Sin	d	L Tan	cd	L Cot	L Cos	d	P P		
0	9.78 934	16	9.89 281	26	0.10 719	9.89 653	10	60		
1	9.78 950	17	9.89 307	26	0.10 693	9.89 643	10	59		
2	9.78 967	16	9.89 333	26	0.10 667	9.89 633	10	58		
3	9.78 983	16	9.89 359	26	0.10 641	9.89 624	10	57		
4	9.78 999	16	9.89 385	26	0.10 615	9.89 614	10	56		
5	9.79 015	16	9.89 411	26	0.10 589	9.89 604	10	55		
6	9.79 031	16	9.89 437	26	0.10 563	9.89 594	10	54		
7	9.79 047	16	9.89 463	26	0.10 537	9.89 584	10	53		
8	9.79 063	16	9.89 489	26	0.10 511	9.89 574	10	52		
9	9.79 079	16	9.89 515	26	0.10 485	9.89 564	10	51		
10	9.79 095	16	9.89 541	26	0.10 459	9.89 554	10	50	26	25
11	9.79 111	16	9.89 567	26	0.10 433	9.89 544	10	49	1	2.6
12	9.79 128	17	9.89 593	26	0.10 407	9.89 534	10	48	2	5.2
13	9.79 144	16	9.89 619	26	0.10 381	9.89 524	10	47	3	7.8
14	9.79 160	16	9.89 645	26	0.10 355	9.89 514	10	46	4	10.4
15	9.79 176	16	9.89 671	26	0.10 329	9.89 504	10	45	5	13.0
16	9.79 192	16	9.89 697	26	0.10 303	9.89 495	9	44	6	15.6
17	9.79 208	16	9.89 723	26	0.10 277	9.89 485	10	43	7	18.2
18	9.79 224	16	9.89 749	26	0.10 251	9.89 475	10	42	8	20.8
19	9.79 240	16	9.89 775	26	0.10 225	9.89 465	10	41	9	22.5
20	9.79 256	16	9.89 801	26	0.10 199	9.89 455	10	40		
21	9.79 272	16	9.89 827	26	0.10 173	9.89 445	10	39		
22	9.79 288	16	9.89 853	26	0.10 147	9.89 435	10	38		
23	9.79 304	15	9.89 879	26	0.10 121	9.89 425	10	37		
24	9.79 319	16	9.89 905	26	0.10 095	9.89 415	10	36		
25	9.79 335	16	9.89 931	26	0.10 069	9.89 405	10	35		
26	9.79 351	16	9.89 957	26	0.10 043	9.89 395	10	34		
27	9.79 367	16	9.89 983	26	0.10 017	9.89 385	10	33	17	16
28	9.79 383	16	9.90 009	26	0.09 991	9.89 375	10	32	1	1.7
29	9.79 399	16	9.90 035	26	0.09 965	9.89 364	11	31	2	3.4
30	9.79 415	16	9.90 061	25	0.09 939	9.89 354	10	30	3	5.1
31	9.79 431	16	9.90 086	26	0.09 914	9.89 344	10	29	4	6.8
32	9.79 447	16	9.90 112	26	0.09 888	9.89 334	10	28	5	8.5
33	9.79 463	15	9.90 138	26	0.09 862	9.89 324	10	27	6	10.2
34	9.79 478	16	9.90 164	26	0.09 836	9.89 314	10	26	7	11.9
35	9.79 494	16	9.90 190	26	0.09 810	9.89 304	10	25	8	13.6
36	9.79 510	16	9.90 216	26	0.09 784	9.89 294	10	24	9	15.3
37	9.79 526	16	9.90 242	26	0.09 758	9.89 284	10	23		
38	9.79 542	16	9.90 268	26	0.09 732	9.89 274	10	22		
39	9.79 558	15	9.90 294	26	0.09 706	9.89 264	10	21		
40	9.79 573	16	9.90 320	26	0.09 680	9.89 254	10	20		
41	9.79 589	16	9.90 346	25	0.09 654	9.89 244	11	19		
42	9.79 605	16	9.90 371	26	0.09 629	9.89 233	10	18		
43	9.79 621	15	9.90 397	26	0.09 603	9.89 223	10	17	11	10
44	9.79 636	16	9.90 423	26	0.09 577	9.89 213	10	16	1	1.1
45	9.79 652	16	9.90 449	26	0.09 551	9.89 203	10	15	2	2.2
46	9.79 668	16	9.90 475	26	0.09 525	9.89 193	10	14	3	3.3
47	9.79 684	16	9.90 501	26	0.09 499	9.89 183	10	13	4	4.4
48	9.79 699	15	9.90 527	26	0.09 473	9.89 173	11	12	5	5.5
49	9.79 715	16	9.90 553	25	0.09 447	9.89 162	10	11	6	6.6
50	9.79 731	15	9.90 578	26	0.09 422	9.89 152	10	10	7	7.7
51	9.79 746	16	9.90 604	26	0.09 396	9.89 142	10	9	8	8.0
52	9.79 762	16	9.90 630	26	0.09 370	9.89 132	10	8		
53	9.79 778	15	9.90 656	26	0.09 344	9.89 122	10	7		
54	9.79 793	16	9.90 682	26	0.09 318	9.89 112	11	6		
55	9.79 809	16	9.90 708	26	0.09 292	9.89 101	10	5		
56	9.79 825	15	9.90 734	25	0.09 266	9.89 091	10	4		
57	9.79 840	16	9.90 759	26	0.09 241	9.89 081	10	3		
58	9.79 856	16	9.90 785	26	0.09 215	9.89 071	11	2		
59	9.79 872	15	9.90 811	26	0.09 189	9.89 060	10	1		
60	9.79 887		9.90 837		0.09 163	9.89 050		0		
	L Cos	d	L Cot	cd	L Tan	L Sin	d	/	P P	

/	L Sin	d	L Tan	cd	L Cot	L Cos	d	P P		
0	9.79 887	16	9.90 837	26	0.09 163	9.89 050	IO	60		
1	9.79 903	15	9.90 863	26	0.09 137	9.89 040	IO	59		
2	9.79 918	16	9.90 880	26	0.09 111	9.89 030	IO	58		
3	9.79 934	16	9.90 914	25	0.09 086	9.89 020	IO	57		
4	9.79 950	15	9.90 940	26	0.09 060	9.88 009	IO	56		
5	9.79 965	16	9.90 966	26	0.09 034	9.88 099	IO	55		
6	9.79 985	16	9.90 992	26	0.09 008	9.88 089	IO	54		
7	9.79 996	15	9.91 018	26	0.08 982	9.88 078	II	53		
8	9.80 012	16	9.91 043	25	0.08 957	9.88 068	IO	52		
9	9.80 027	15	9.91 069	26	0.08 931	9.88 058	IO	51		
10	9.80 043	15	9.91 095	26	0.08 905	9.88 048	II	50	26	25
11	9.80 058	16	9.91 121	26	0.08 879	9.88 037	IO	49	I	2.6
12	9.80 074	16	9.91 147	25	0.08 853	9.88 027	IO	48	2	5.2
13	9.80 089	15	9.91 172	26	0.08 828	9.88 017	IO	47	3	7.8
14	9.80 105	15	9.91 198	26	0.08 802	9.88 006	II	46	4	10.4
15	9.80 120	16	9.91 224	26	0.08 776	9.88 096	IO	45	5	13.0
16	9.80 136	16	9.91 250	26	0.08 750	9.88 086	IO	44	6	15.6
17	9.80 151	15	9.91 276	26	0.08 724	9.88 075	II	43	7	18.2
18	9.80 166	15	9.91 301	25	0.08 699	9.88 065	IO	42	8	20.8
19	9.80 182	15	9.91 327	26	0.08 673	9.88 055	II	41	9	23.4
20	9.80 197	16	9.91 353	26	0.08 647	9.88 044	IO	40		
21	9.80 213	15	9.91 379	25	0.08 621	9.88 034	IO	39		
22	9.80 228	16	9.91 404	26	0.08 596	9.88 024	II	38		
23	9.80 244	16	9.91 430	26	0.08 570	9.88 013	IO	37		
24	9.80 259	15	9.91 456	26	0.08 544	9.88 003	IO	36		
25	9.80 274	16	9.91 482	26	0.08 518	9.88 093	IO	35		
26	9.80 290	15	9.91 507	25	0.08 493	9.88 082	IO	34		
27	9.80 305	15	9.91 533	26	0.08 467	9.88 072	II	33		
28	9.80 320	15	9.91 559	26	0.08 441	9.88 061	IO	32	I	1.6
29	9.80 336	15	9.91 585	25	0.08 415	9.88 051	IO	31	2	3.2
30	9.80 351	15	9.91 610	26	0.08 390	9.88 041	II	30	3	4.8
31	9.80 366	16	9.91 636	26	0.08 364	9.88 030	IO	29	4	6.4
32	9.80 382	15	9.91 662	26	0.08 338	9.88 020	IO	28	5	8.0
33	9.80 397	15	9.91 688	26	0.08 312	9.88 010	II	27	6	7.5
34	9.80 412	16	9.91 713	26	0.08 287	9.88 000	II	26	7	9.6
35	9.80 428	15	9.91 739	26	0.08 261	9.88 090	IO	25	8	11.2
36	9.80 443	15	9.91 765	26	0.08 235	9.88 078	IO	24	9	12.8
37	9.80 458	15	9.91 791	26	0.08 209	9.88 068	II	23		
38	9.80 473	16	9.91 816	25	0.08 184	9.88 057	IO	22		
39	9.80 489	15	9.91 842	26	0.08 158	9.88 047	II	21		
40	9.80 504	15	9.91 868	25	0.08 132	9.88 036	IO	20		
41	9.80 519	15	9.91 893	26	0.08 107	9.88 026	II	19		
42	9.80 534	16	9.91 919	26	0.08 081	9.88 015	IO	18		
43	9.80 550	15	9.91 945	26	0.08 055	9.88 005	II	17		
44	9.80 565	15	9.91 971	25	0.08 029	9.88 594	IO	16		
45	9.80 580	15	9.91 996	25	0.08 004	9.88 584	II	15		
46	9.80 595	15	9.92 022	26	0.07 978	9.88 573	IO	14		
47	9.80 610	15	9.92 048	25	0.07 952	9.88 563	II	13		
48	9.80 625	16	9.92 073	26	0.07 927	9.88 552	IO	12		
49	9.80 641	15	9.92 099	26	0.07 901	9.88 542	II	11		
50	9.80 656	15	9.92 125	25	0.07 875	9.88 531	IO	10		
51	9.80 671	15	9.92 150	26	0.07 850	9.88 521	II	9		
52	9.80 686	15	9.92 176	26	0.07 824	9.88 510	II	8		
53	9.80 701	15	9.92 202	25	0.07 798	9.88 499	IO	7		
54	9.80 716	15	9.92 227	26	0.07 773	9.88 489	II	6		
55	9.80 731	15	9.92 253	26	0.07 747	9.88 478	IO	5		
56	9.80 746	16	9.92 279	25	0.07 721	9.88 468	II	4		
57	9.80 762	15	9.92 304	26	0.07 696	9.88 457	IO	3		
58	9.80 777	15	9.92 330	26	0.07 670	9.88 447	II	2		
59	9.80 792	15	9.92 356	25	0.07 644	9.88 436	II	1		
60	9.80 807		9.92 381		0.07 619	9.88 425	IO	0		
/	L Cos	d	L Cot	cd	L Tan	L Sin	d	/	P P	

/	L Sin	d	L Tan	c d	L Cot	L Cos	d	P P		
O	9.80 807	15	9.92 381	26	0.07 619	9.88 425	10	60		
1	9.80 822	15	9.92 407	26	0.07 593	9.88 415	10	59		
2	9.80 837	15	9.92 433	25	0.07 507	9.88 404	11	58		
3	9.80 852	15	9.92 458	25	0.07 542	9.88 394	10	57		
4	9.80 867	15	9.92 484	26	0.07 516	9.88 383	11	56		
5	9.80 882	15	9.92 510	26	0.07 490	9.88 372	11	55		
6	9.80 897	15	9.92 535	25	0.07 465	9.88 362	10	54		
7	9.80 912	15	9.92 561	26	0.07 439	9.88 351	11	53		
8	9.80 927	15	9.92 587	25	0.07 413	9.88 340	11	52		
9	9.80 942	15	9.92 612	26	0.07 388	9.88 330	10	51		
10	9.80 957	15	9.92 638	25	0.07 362	9.88 319	11	50	26	25
11	9.80 972	15	9.92 663	26	0.07 337	9.88 308	10	49	1	2.6
12	9.80 987	15	9.92 689	26	0.07 311	9.88 298	10	48	2	5.2
13	9.80 002	15	9.92 715	25	0.07 285	9.88 287	11	47	3	7.8
14	9.81 017	15	9.92 740	25	0.07 260	9.88 276	11	46	4	10.4
15	9.81 032	15	9.92 766	26	0.07 234	9.88 266	10	45	5	13.0
16	9.81 047	15	9.92 792	26	0.07 208	9.88 255	11	44	6	12.5
17	9.81 061	14	9.92 817	25	0.07 183	9.88 244	10	43	7	15.6
18	9.81 076	15	9.92 843	26	0.07 157	9.88 234	10	42	8	15.0
19	9.81 091	15	9.92 868	25	0.07 132	9.88 223	11	41	9	18.2
20	9.81 106	15	9.92 894	26	0.07 106	9.88 212	11	40		
21	9.81 121	15	9.92 920	25	0.07 080	9.88 201	10	39		
22	9.81 136	15	9.92 945	26	0.07 055	9.88 191	10	38		
23	9.81 151	15	9.92 971	25	0.07 029	9.88 180	11	37		
24	9.81 166	15	9.92 996	26	0.07 004	9.88 169	11	36		
25	9.81 180	14	9.93 022	26	0.06 978	9.88 158	10	35		
26	9.81 195	15	9.93 048	26	0.06 952	9.88 148	11	34		
27	9.81 210	15	9.93 073	26	0.06 927	9.88 137	11	33		
28	9.81 225	15	9.93 099	25	0.06 901	9.88 126	11	32	1	1.5
29	9.81 240	15	9.93 124	26	0.06 876	9.88 115	10	31	2	3.0
30	9.81 254	15	9.93 150	25	0.06 850	9.88 105	11	30	3	4.5
31	9.81 269	15	9.93 175	26	0.06 825	9.88 094	11	29	4	6.0
32	9.81 284	15	9.93 201	26	0.06 799	9.88 083	11	28	5	7.5
33	9.81 299	15	9.93 227	25	0.06 773	9.88 072	11	27	6	9.0
34	9.81 314	14	9.93 252	26	0.06 748	9.88 061	10	26	7	10.5
35	9.81 328	14	9.93 278	26	0.06 722	9.88 051	11	25	8	12.0
36	9.81 343	15	9.93 303	26	0.06 697	9.88 040	11	24	9	13.5
37	9.81 358	14	9.93 329	25	0.06 671	9.88 029	11	23		
38	9.81 372	14	9.93 354	26	0.06 646	9.88 018	11	22		
39	9.81 387	15	9.93 380	26	0.06 620	9.88 007	11	21		
40	9.81 402	15	9.93 406	25	0.06 594	9.87 996	11	20		
41	9.81 417	14	9.93 431	26	0.06 569	9.87 985	10	19		
42	9.81 431	14	9.93 457	25	0.06 543	9.87 975	11	18		
43	9.81 446	15	9.93 482	26	0.06 518	9.87 964	11	17		
44	9.81 461	14	9.93 508	25	0.06 492	9.87 953	11	16		
45	9.81 475	14	9.93 533	26	0.06 467	9.87 942	11	15	1	1.1
46	9.81 490	15	9.93 559	25	0.06 441	9.87 931	11	14	2	2.2
47	9.81 505	14	9.93 584	26	0.06 416	9.87 920	11	13	3	3.3
48	9.81 519	15	9.93 610	26	0.06 390	9.87 909	11	12	4	4.4
49	9.81 534	15	9.93 636	25	0.06 364	9.87 898	11	11	5	5.5
50	9.81 549	14	9.93 661	26	0.06 339	9.87 887	10	10	6	6.0
51	9.81 563	15	9.93 687	25	0.06 313	9.87 877	11	9	7	7.7
52	9.81 578	15	9.93 712	26	0.06 288	9.87 866	11	8	8	8.0
53	9.81 592	14	9.93 738	25	0.06 262	9.87 855	11	7	9	9.0
54	9.81 607	15	9.93 763	26	0.06 237	9.87 844	11	6		
55	9.81 622	15	9.93 789	26	0.06 211	9.87 833	11	5		
56	9.81 636	14	9.93 814	25	0.06 186	9.87 822	11	4		
57	9.81 651	14	9.93 840	25	0.06 160	9.87 811	11	3		
58	9.81 665	15	9.93 865	26	0.06 135	9.87 800	11	2		
59	9.81 680	14	9.93 891	25	0.06 109	9.87 789	11	1		
60	9.81 694	—	9.93 916	—	0.06 084	9.87 778	10	0		
	L Cos	d	L Cot	c d	L Tan	L Sin	d	/	P P	

/	L Sin	d	L Tan	c d	L Cot	L Cos	d	P P	
0	9.81 694	15	9.93 916	26	0.06 084	9.87 778	11	60	
1	9.81 709	14	9.93 942	25	0.06 058	9.87 767	11	59	
2	9.81 723	15	9.93 967	26	0.06 033	9.87 756	11	58	
3	9.81 738	14	9.93 993	25	0.06 007	9.87 745	11	57	
4	9.81 752	15	9.94 018	26	0.05 982	9.87 734	11	56	
5	9.81 767	14	9.94 044	25	0.05 956	9.87 723	11	55	
6	9.81 781	15	9.94 069	26	0.05 931	9.87 712	11	54	
7	9.81 796	14	9.94 095	25	0.05 905	9.87 701	11	53	
8	9.81 810	15	9.94 120	26	0.05 880	9.87 690	11	52	
9	9.81 825	14	9.94 146	25	0.05 854	9.87 679	11	51	
10	9.81 839	15	9.94 171	26	0.05 829	9.87 668	11	50	
11	9.81 854	14	9.94 197	25	0.05 803	9.87 657	11	49	
12	9.81 868	14	9.94 222	26	0.05 778	9.87 646	11	48	
13	9.81 882	14	9.94 248	26	0.05 752	9.87 635	11	47	
14	9.81 897	15	9.94 273	25	0.05 727	9.87 624	11	46	
15	9.81 911	14	9.94 299	26	0.05 701	9.87 613	11	45	
16	9.81 926	15	9.94 324	25	0.05 676	9.87 601	11	44	
17	9.81 940	14	9.94 350	25	0.05 650	9.87 590	11	43	
18	9.81 955	15	9.94 375	25	0.05 625	9.87 579	11	42	
19	9.81 969	14	9.94 401	26	0.05 599	9.87 568	11	41	
20	9.81 983	15	9.94 426	26	0.05 574	9.87 557	11	40	
21	9.81 998	14	9.94 452	25	0.05 548	9.87 546	11	39	
22	9.82 012	14	9.94 477	26	0.05 523	9.87 535	11	38	
23	9.82 026	14	9.94 503	25	0.05 497	9.87 524	11	37	
24	9.82 041	15	9.94 528	26	0.05 472	9.87 513	11	36	
25	9.82 055	14	9.94 554	26	0.05 446	9.87 501	12	35	
26	9.82 069	14	9.94 579	25	0.05 421	9.87 490	11	34	
27	9.82 084	15	9.94 604	26	0.05 396	9.87 479	11	33	
28	9.82 098	14	9.94 630	26	0.05 370	9.87 468	11	32	
29	9.82 112	14	9.94 655	25	0.05 345	9.87 457	11	31	
30	9.82 126	15	9.94 681	25	0.05 319	9.87 446	12	30	
31	9.82 141	14	9.94 706	26	0.05 294	9.87 434	11	29	
32	9.82 155	14	9.94 732	25	0.05 268	9.87 423	11	28	
33	9.82 169	14	9.94 757	26	0.05 243	9.87 412	11	27	
34	9.82 184	14	9.94 783	25	0.05 217	9.87 401	11	26	
35	9.82 198	14	9.94 808	25	0.05 192	9.87 390	11	25	
36	9.82 212	14	9.94 834	26	0.05 166	9.87 378	12	24	
37	9.82 226	14	9.94 859	25	0.05 141	9.87 367	11	23	
38	9.82 240	14	9.94 884	26	0.05 116	9.87 356	11	22	
39	9.82 255	15	9.94 910	26	0.05 090	9.87 345	11	21	
40	9.82 269	14	9.94 935	26	0.05 065	9.87 334	12	20	
41	9.82 283	14	9.94 961	25	0.05 039	9.87 322	11	19	
42	9.82 297	14	9.94 986	26	0.05 014	9.87 311	11	18	
43	9.82 311	14	9.95 012	25	0.04 988	9.87 300	12	17	
44	9.82 326	14	9.95 037	25	0.04 963	9.87 288	11	16	
45	9.82 340	14	9.95 062	25	0.04 938	9.87 277	11	15	
46	9.82 354	14	9.95 088	26	0.04 912	9.87 266	11	14	
47	9.82 368	14	9.95 113	26	0.04 887	9.87 255	12	13	
48	9.82 382	14	9.95 139	25	0.04 861	9.87 243	11	12	
49	9.82 396	14	9.95 164	25	0.04 836	9.87 232	11	11	
50	9.82 410	14	9.95 190	25	0.04 810	9.87 221	12	10	
51	9.82 424	15	9.95 215	25	0.04 785	9.87 209	11	9	
52	9.82 439	14	9.95 240	26	0.04 760	9.87 198	11	8	
53	9.82 453	14	9.95 266	25	0.04 734	9.87 187	12	7	
54	9.82 467	14	9.95 291	26	0.04 709	9.87 175	11	6	
55	9.82 481	14	9.95 317	25	0.04 683	9.87 164	11	5	
56	9.82 495	14	9.95 342	26	0.04 658	9.87 153	12	4	
57	9.82 509	14	9.95 368	25	0.04 632	9.87 141	11	3	
58	9.82 523	14	9.95 393	25	0.04 607	9.87 130	11	2	
59	9.82 537	14	9.95 418	26	0.04 582	9.87 119	12	1	
60	9.82 551	14	9.95 444	25	0.04 556	9.87 107	11	0	

L Cos

d

L Cot

c d

L Tan

L Sin

d

/

P P

/	L Sin	d	L Tan	c d	L Cot	L Cos	d	P P
0	9.82 551	14	9.95 444	25	0.04 556	9.87 107	60	
1	9.82 565	14	9.95 469	26	0.04 531	9.87 066	59	
2	9.82 579	14	9.95 495	25	0.04 505	9.87 085	58	
3	9.82 593	14	9.95 520	25	0.04 480	9.87 073	57	
4	9.82 607	14	9.95 545	26	0.04 455	9.87 062	56	
5	9.82 621	14	9.95 571	25	0.04 429	9.87 050	55	
6	9.82 635	14	9.95 596	26	0.04 404	9.87 039	54	
7	9.82 649	14	9.95 622	25	0.04 378	9.87 028	53	
8	9.82 663	14	9.95 647	25	0.04 353	9.87 016	52	
9	9.82 677	14	9.95 672	26	0.04 328	9.87 005	51	
10	9.82 691	14	9.95 698	25	0.04 302	9.86 993	50	
11	9.82 705	14	9.95 723	25	0.04 277	9.86 982	49	
12	9.82 719	14	9.95 748	26	0.04 252	9.86 970	48	
13	9.82 733	14	9.95 774	25	0.04 226	9.86 959	47	
14	9.82 747	14	9.95 799	26	0.04 201	9.86 947	46	
15	9.82 761	14	9.95 825	25	0.04 175	9.86 936	45	
16	9.82 775	14	9.95 850	25	0.04 150	9.86 924	44	
17	9.82 788	14	9.95 875	26	0.04 125	9.86 913	43	
18	9.82 802	14	9.95 901	25	0.04 099	9.86 902	42	
19	9.82 816	14	9.95 926	26	0.04 074	9.86 890	41	
20	9.82 830	14	9.95 952	25	0.04 048	9.86 879	40	
21	9.82 844	14	9.95 977	25	0.04 023	9.86 867	39	
22	9.82 858	14	9.96 002	26	0.03 998	9.86 855	38	
23	9.82 872	13	9.96 028	25	0.03 972	9.86 844	37	
24	9.82 885	14	9.96 053	25	0.03 947	9.86 832	36	
25	9.82 899	14	9.96 078	25	0.03 922	9.86 821	35	
26	9.82 913	14	9.96 104	25	0.03 896	9.86 809	34	
27	9.82 927	14	9.96 129	26	0.03 871	9.86 798	33	
28	9.82 941	14	9.96 155	25	0.03 845	9.86 786	32	
29	9.82 955	13	9.96 180	25	0.03 820	9.86 775	31	
30	9.82 968	14	9.96 205	26	0.03 795	9.86 763	30	
31	9.82 982	14	9.96 231	25	0.03 769	9.86 752	29	
32	9.82 996	14	9.96 256	25	0.03 744	9.86 740	28	
33	9.83 010	13	9.96 281	26	0.03 719	9.86 728	27	
34	9.83 023	14	9.96 307	25	0.03 693	9.86 717	26	
35	9.83 037	14	9.96 332	25	0.03 668	9.86 705	25	
36	9.83 051	14	9.96 357	26	0.03 643	9.86 694	24	
37	9.83 065	13	9.96 383	25	0.03 617	9.86 682	23	
38	9.83 078	14	9.96 408	25	0.03 592	9.86 670	22	
39	9.83 092	14	9.96 433	26	0.03 567	9.86 659	21	
40	9.83 106	14	9.96 459	25	0.03 541	9.86 647	20	
41	9.83 120	13	9.96 484	26	0.03 516	9.86 635	19	
42	9.83 133	14	9.96 510	25	0.03 490	9.86 624	18	
43	9.83 147	14	9.96 535	25	0.03 465	9.86 612	17	
44	9.83 161	13	9.96 560	26	0.03 440	9.86 600	16	
45	9.83 174	14	9.96 586	25	0.03 414	9.86 589	15	
46	9.83 188	14	9.96 611	25	0.03 389	9.86 577	14	
47	9.83 202	13	9.96 636	26	0.03 364	9.86 565	13	
48	9.83 215	14	9.96 662	25	0.03 338	9.86 554	12	
49	9.83 229	13	9.96 687	25	0.03 313	9.86 542	11	
50	9.83 242	14	9.96 712	26	0.03 288	9.86 530	10	
51	9.83 256	14	9.96 738	25	0.03 262	9.86 518	9	
52	9.83 270	13	9.96 763	25	0.03 237	9.86 507	8	
53	9.83 283	14	9.96 788	26	0.03 212	9.86 495	7	
54	9.83 297	13	9.96 814	25	0.03 186	9.86 483	6	
55	9.83 310	14	9.96 839	25	0.03 161	9.86 472	5	
56	9.83 324	14	9.96 864	26	0.03 136	9.86 460	4	
57	9.83 338	13	9.96 890	25	0.03 110	9.86 448	3	
58	9.83 351	14	9.96 915	25	0.03 085	9.86 436	2	
59	9.83 365	13	9.96 940	26	0.03 060	9.86 425	1	
60	9.83 378	13	9.96 966	25	0.03 034	9.86 413	0	
	L Cos	d	L Cot	c d	L Tan	L Sin	d	P P

	L Sin	d	L Tan	c d	L Cot	L Cos	d		P P
0	9.83 378	14	9.96 966	25	0.03 034	9.86 413	12	60	
1	9.83 392	13	9.96 991	25	0.03 009	9.86 401	12	59	
2	9.83 405	14	9.97 010	25	0.02 984	9.86 389	12	58	
3	9.83 419	13	9.97 042	20	0.02 958	9.86 377	12	57	
4	9.83 432	14	9.97 067	25	0.02 933	9.86 366	12	56	
5	9.83 446	14	9.97 092	25	0.02 908	9.86 354	12	55	
6	9.83 459	13	9.97 118	20	0.02 882	9.86 342	12	54	
7	9.83 473	14	9.97 143	25	0.02 857	9.86 330	12	53	
8	9.83 486	13	9.97 168	25	0.02 832	9.86 318	12	52	
9	9.83 500	14	9.97 193	25	0.02 807	9.86 306	12	51	
10	9.83 513	14	9.97 219	25	0.02 781	9.86 295	12	50	26
11	9.83 527	13	9.97 244	25	0.02 756	9.86 283	12	49	1 2.6
12	9.83 540	13	9.97 269	20	0.02 731	9.86 271	12	48	2 5.2
13	9.83 554	14	9.97 295	25	0.02 705	9.86 259	12	47	3 7.8
14	9.83 567	13	9.97 320	25	0.02 680	9.86 247	12	46	4 10.4
15	9.83 581	14	9.97 345	25	0.02 655	9.86 235	12	45	5 13.0
16	9.83 594	14	9.97 371	20	0.02 629	9.86 223	12	44	6 15.6
17	9.83 608	13	9.97 396	25	0.02 604	9.86 211	12	43	7 18.2
18	9.83 621	13	9.97 421	20	0.02 579	9.86 200	12	42	8 20.8
19	9.83 634	14	9.97 447	25	0.02 553	9.86 188	12	41	9 23.4
20	9.83 648	13	9.97 472	25	0.02 528	9.86 176	12	40	
21	9.83 661	13	9.97 497	26	0.02 503	9.86 164	12	39	
22	9.83 674	13	9.97 523	26	0.02 477	9.86 152	12	38	
23	9.83 688	14	9.97 548	25	0.02 452	9.86 140	12	37	
24	9.83 701	13	9.97 573	25	0.02 427	9.86 128	12	36	
25	9.83 715	14	9.97 598	26	0.02 402	9.86 116	12	35	
26	9.83 728	13	9.97 624	25	0.02 376	9.86 104	12	34	
27	9.83 741	13	9.97 649	25	0.02 351	9.86 092	12	33	
28	9.83 755	14	9.97 674	25	0.02 326	9.86 080	12	32	1 1.4
29	9.83 768	13	9.97 700	25	0.02 300	9.86 068	12	31	2 2.8
30	9.83 781	14	9.97 725	25	0.02 275	9.86 056	12	30	3 4.2
31	9.83 795	13	9.97 750	26	0.02 250	9.86 044	12	29	4 5.6
32	9.83 808	13	9.97 776	26	0.02 224	9.86 032	12	28	5 7.0
33	9.83 821	13	9.97 801	25	0.02 199	9.86 020	12	27	6 8.4
34	9.83 834	13	9.97 826	25	0.02 174	9.86 008	12	26	7 9.8
35	9.83 848	14	9.97 851	26	0.02 149	9.85 996	12	25	8 11.2
36	9.83 861	13	9.97 877	25	0.02 123	9.85 984	12	24	9 12.6
37	9.83 874	13	9.97 902	25	0.02 098	9.85 972	12	23	
38	9.83 887	13	9.97 927	26	0.02 073	9.85 960	12	22	
39	9.83 901	14	9.97 953	25	0.02 047	9.85 948	12	21	
40	9.83 914	13	9.97 978	25	0.02 022	9.85 936	12	20	
41	9.83 927	13	9.98 003	26	0.01 997	9.85 924	12	19	
42	9.83 940	13	9.98 029	26	0.01 971	9.85 912	12	18	
43	9.83 954	13	9.98 054	25	0.01 946	9.85 900	12	17	
44	9.83 967	13	9.98 079	25	0.01 921	9.85 888	12	16	
45	9.83 980	13	9.98 104	26	0.01 896	9.85 876	12	15	
46	9.83 993	13	9.98 130	26	0.01 870	9.85 864	12	14	
47	9.84 006	14	9.98 155	25	0.01 845	9.85 851	12	13	
48	9.84 020	13	9.98 180	26	0.01 820	9.85 839	12	12	
49	9.84 033	13	9.98 206	25	0.01 794	9.85 827	12	11	
50	9.84 046	13	9.98 231	25	0.01 769	9.85 815	12	10	
51	9.84 059	13	9.98 256	25	0.01 744	9.85 803	12	9	
52	9.84 072	13	9.98 281	26	0.01 719	9.85 791	12	8	
53	9.84 085	13	9.98 307	25	0.01 693	9.85 779	13	7	
54	9.84 098	13	9.98 332	25	0.01 668	9.85 766	12	6	
55	9.84 112	14	9.98 357	25	0.01 643	9.85 754	12	5	
56	9.84 125	13	9.98 383	26	0.01 617	9.85 742	12	4	
57	9.84 138	13	9.98 408	25	0.01 592	9.85 730	12	3	
58	9.84 151	13	9.98 433	25	0.01 567	9.85 718	12	2	
59	9.84 164	13	9.98 458	26	0.01 542	9.85 706	13	1	
60	9.84 177		9.98 484		0.01 516	9.85 693		O	
			L Cos	d	L Cot	c d	L Tan	L Sin	d /
									P P

/	L Sin	d	L Tan	c d	L Cot	L Cos	d	P P		
0	9.84 177	13	9.98 484	25	0.01 516	9.85 693	12	60		
1	9.84 190	13	9.98 509	25	0.01 491	9.85 681	12	59		
2	9.84 203	13	9.98 534	25	0.01 466	9.85 669	12	58		
3	9.84 216	13	9.98 560	26	0.01 440	9.85 657	12	57		
4	9.84 229		9.98 585	25	0.01 415	9.85 645		56		
5	9.84 242	13	9.98 610	25	0.01 390	9.85 632	13	55		
6	9.84 255	13	9.98 635	25	0.01 365	9.85 620	12	54		
7	9.84 269	14	9.98 661	25	0.01 339	9.85 608	12	53		
8	9.84 282	13	9.98 686	25	0.01 314	9.85 596	13	52		
9	9.84 295	13	9.98 711	25	0.01 289	9.85 583	12	51		
10	9.84 308	13	9.98 737	25	0.01 263	9.85 571	12	50		
11	9.84 321	13	9.98 762	25	0.01 238	9.85 559	12	49		
12	9.84 334	13	9.98 787	25	0.01 213	9.85 547	13	48		
13	9.84 347	13	9.98 812	25	0.01 188	9.85 534	12	47		
14	9.84 360		9.98 838	26	0.01 162	9.85 522	12	46		
15	9.84 373	13	9.98 863	25	0.01 137	9.85 510	13	45		
16	9.84 385	12	9.98 888	25	0.01 112	9.85 497	13	44	26	25
17	9.84 398	13	9.98 913	26	0.01 087	9.85 485	12	43	1 2.6	2.5
18	9.84 411	13	9.98 939	25	0.01 061	9.85 473	13	42	2 5.2	5.0
19	9.84 424	13	9.98 964	25	0.01 036	9.85 460	12	41	3 7.8	7.5
20	9.84 437	13	9.98 989	26	0.01 011	9.85 448	12	40	4 10.4	10.0
21	9.84 450		9.99 015	25	0.00 985	9.85 436	13	39	5 13.0	12.5
22	9.84 463	13	9.99 040	25	0.00 960	9.85 423	12	38	6 15.6	15.0
23	9.84 476	13	9.99 065	25	0.00 935	9.85 411	12	37	7 18.2	17.5
24	9.84 489		9.99 090	26	0.00 910	9.85 399	13	36	8 20.8	20.0
25	9.84 502	13	9.99 116	26	0.00 884	9.85 386	12	35	9 23.4	22.5
26	9.84 515	13	9.99 141	25	0.00 859	9.85 374	13	34		
27	9.84 528	12	9.99 166	25	0.00 834	9.85 361	12	33		
28	9.84 540	13	9.99 191	26	0.00 809	9.85 349	12	32		
29	9.84 553	13	9.99 217	25	0.00 783	9.85 337	13	31		
30	9.84 566	13	9.99 242	25	0.00 758	9.85 324	12	30		
31	9.84 579	13	9.99 267	26	0.00 733	9.85 312	13	29		
32	9.84 592	13	9.99 293	25	0.00 707	9.85 299	12	28		
33	9.84 605	13	9.99 318	25	0.00 682	9.85 287	13	27		
34	9.84 618		9.99 343	25	0.00 657	9.85 274	12	26		
35	9.84 630	12	9.99 368	25	0.00 632	9.85 262	12	25		
36	9.84 643	13	9.99 394	25	0.00 606	9.85 250	13	24		
37	9.84 656	13	9.99 419	25	0.00 581	9.85 237	12	23		
38	9.84 669	13	9.99 444	25	0.00 556	9.85 225	12	22	14	13
39	9.84 682	12	9.99 469	26	0.00 531	9.85 212	13	21	1 1.4	1.3
40	9.84 694	13	9.99 495	25	0.00 505	9.85 200	12	20	2 2.8	2.4
41	9.84 707	13	9.99 520	25	0.00 480	9.85 187	13	19	3 4.2	3.6
42	9.84 720	13	9.99 545	25	0.00 455	9.85 175	12	18	4 5.6	5.2
43	9.84 733	12	9.99 570	26	0.00 430	9.85 162	13	17	5 7.0	6.0
44	9.84 745		9.99 596	25	0.00 404	9.85 150	12	16	6 8.4	7.8
45	9.84 758	13	9.99 621	25	0.00 379	9.85 137	13	15	7 9.8	9.1
46	9.84 771	13	9.99 646	26	0.00 354	9.85 125	12	14	8 11.2	10.4
47	9.84 784	12	9.99 672	25	0.00 328	9.85 112	12	13	9 12.6	11.7
48	9.84 796	13	9.99 697	25	0.00 303	9.85 100	13	12		
49	9.84 809	13	9.99 722	25	0.00 278	9.85 087	13	11		
50	9.84 822	13	9.99 747	26	0.00 253	9.85 074	12	10		
51	9.84 835	12	9.99 773	25	0.00 227	9.85 062	13	9		
52	9.84 847	13	9.99 798	25	0.00 202	9.85 049	12	8		
53	9.84 860	13	9.99 823	25	0.00 177	9.85 037	13	7		
54	9.84 873		9.99 848	26	0.00 152	9.85 024	12	6		
55	9.84 885	12	9.99 874	25	0.00 126	9.85 012	13	5		
56	9.84 898	13	9.99 899	25	0.00 101	9.84 999	13	4		
57	9.84 911	12	9.99 924	25	0.00 076	9.84 986	12	3		
58	9.84 923	13	9.99 949	26	0.00 051	9.84 974	13	2		
59	9.84 936	13	9.99 975	25	0.00 025	9.84 961	12	1		
60	9.84 949		0.00 000		0.00 000	9.84 949	12	0		
	L Cos	d	L Cot	c d	L Tan	L Sin	d	/	P P	

TABLE III

LOGARITHMS

OF THE

TRIGONOMETRIC FUNCTIONS

From $0^\circ 0'$ to $0^\circ 3'$, and from $89^\circ 57'$ to 90° , for every second.

From 0° to 2° , and from 88° to 90° , for every ten seconds.

NOTE.—The characteristic of every logarithm in the following table is too large by 10. Therefore, -10 should be written after every logarithm.

0°					0°				
L Sin and L Tan					L Sin and L Tan				
11	0'	1'	2'	11	11	0'	1'	2'	11
0	—	6.46 373	6.76 476	60	30	6.16 270	6.63 982	6.86 167	30
1	4.68 557	6.47 090	6.76 836	59	31	6.17 694	6.64 462	6.86 455	29
2	4.98 660	6.47 797	6.77 193	58	32	6.19 072	6.64 936	6.86 742	28
3	5.16 270	6.48 492	6.77 548	57	33	6.20 409	6.65 406	6.87 027	27
4	5.28 763	6.49 175	6.77 900	56	34	6.21 705	6.65 870	6.87 310	26
5	5.38 454	6.49 849	6.78 248	55	35	6.22 964	6.66 330	6.87 591	25
6	5.46 373	6.50 512	6.78 595	54	36	6.24 188	6.66 785	6.87 870	24
7	5.53 067	6.51 165	6.78 938	53	37	6.25 378	6.67 235	6.88 147	23
8	5.58 866	6.51 808	6.79 278	52	38	6.26 536	6.67 680	6.88 423	22
9	5.63 982	6.52 442	6.79 616	51	39	6.27 664	6.68 121	6.88 697	21
10	5.68 557	6.53 067	6.79 952	50	40	6.28 763	6.68 557	6.88 969	20
11	5.72 697	6.53 683	6.80 285	49	41	6.29 836	6.68 990	6.89 240	19
12	5.76 476	6.54 291	6.80 615	48	42	6.30 882	6.69 418	6.89 509	18
13	5.79 952	6.54 890	6.80 943	47	43	6.31 904	6.69 841	6.89 776	17
14	5.83 170	6.55 481	6.81 268	46	44	6.32 903	6.70 261	6.90 042	16
15	5.86 167	6.56 064	6.81 591	45	45	6.33 079	6.70 676	6.90 306	15
16	5.88 969	6.56 639	6.81 911	44	46	6.34 833	6.71 088	6.90 568	14
17	5.91 602	6.57 207	6.82 230	43	47	6.35 767	6.71 496	6.90 829	13
18	5.94 085	6.57 767	6.82 545	42	48	6.36 682	6.71 900	6.91 088	12
19	5.96 433	6.58 320	6.82 859	41	49	6.37 577	6.72 300	6.91 346	11
20	5.98 660	6.58 866	6.83 170	40	50	6.38 454	6.72 697	6.91 602	10
21	6.00 779	6.59 406	6.83 479	39	51	6.39 315	6.73 090	6.91 857	9
22	6.02 800	6.59 939	6.83 786	38	52	6.40 158	6.73 479	6.92 110	8
23	6.04 730	6.60 465	6.84 091	37	53	6.40 985	6.73 865	6.92 362	7
24	6.06 579	6.60 985	6.84 394	36	54	6.41 797	6.74 248	6.92 612	6
25	6.08 351	6.61 499	6.84 604	35	55	6.42 594	6.74 627	6.92 861	5
26	6.10 055	6.62 007	6.84 993	34	56	6.43 376	6.75 003	6.93 109	4
27	6.11 694	6.62 509	6.85 289	33	57	6.44 145	6.75 376	6.93 355	3
28	6.13 273	6.63 006	6.85 584	32	58	6.44 900	6.75 746	6.93 599	2
29	6.14 797	6.63 496	6.85 876	31	59	6.45 643	6.76 112	6.93 843	1
30	6.16 270	6.63 982	6.86 167	30	60	6.46 373	6.76 476	6.94 085	0
11	59'	58'	57'	11	11	59'	58'	57'	11

L Cos and L Cot

89°

L Cos and L Cot

0°

111	L Sin	L Tan	L Cos	111	111	L Sin	L Tan	L Cos	111
0 0	—	—	10.00000	0 60	10 0	7.46 373	7.46 373	10.00000	0 50
10 5.68 557	5.68 557	5.68 557	10.00000	50	10	7.47 090	7.47 091	10.00000	50
20 5.98 660	5.98 660	5.98 660	10.00000	40	20	7.47 797	7.47 797	10.00000	40
30 6.16 270	6.16 270	6.16 270	10.00000	30	30	7.48 491	7.48 492	10.00000	30
40 6.28 763	6.28 763	6.28 763	10.00000	20	40	7.49 175	7.49 176	10.00000	20
50 6.38 454	6.38 454	6.38 454	10.00000	10	50	7.49 849	7.49 849	10.00000	10
1 0 6.46 373	6.46 373	6.46 373	10.00000	0 59	11 0	7.50 512	7.50 512	10.00000	0 49
10 6.53 067	6.53 067	6.53 067	10.00000	50	10	7.51 165	7.51 165	10.00000	50
20 6.58 866	6.58 866	6.58 866	10.00000	40	20	7.51 808	7.51 809	10.00000	40
30 6.63 982	6.63 982	6.63 982	10.00000	30	30	7.52 442	7.52 443	10.00000	30
40 6.68 557	6.68 557	6.68 557	10.00000	20	40	7.53 067	7.53 067	10.00000	20
50 6.72 697	6.72 697	6.72 697	10.00000	10	50	7.53 683	7.53 683	10.00000	10
2 0 6.76 476	6.76 476	6.76 476	10.00000	0 58	12 0	7.54 291	7.54 291	10.00000	0 48
10 6.79 952	6.79 952	6.79 952	10.00000	50	10	7.54 890	7.54 890	10.00000	50
20 6.83 170	6.83 170	6.83 170	10.00000	40	20	7.55 481	7.55 481	10.00000	40
30 6.86 167	6.86 167	6.86 167	10.00000	30	30	7.56 064	7.56 064	10.00000	30
40 6.88 969	6.88 969	6.88 969	10.00000	20	40	7.56 639	7.56 639	10.00000	20
50 6.91 602	6.91 602	6.91 602	10.00000	10	50	7.57 206	7.57 207	10.00000	10
3 0 6.94 085	6.94 085	6.94 085	10.00000	0 57	13 0	7.57 767	7.57 767	10.00000	0 47
10 6.96 433	6.96 433	6.96 433	10.00000	50	10	7.58 320	7.58 320	10.00000	50
20 6.98 660	6.98 660	6.98 660	10.00000	40	20	7.58 866	7.58 867	10.00000	40
30 7.00 779	7.00 779	7.00 779	10.00000	30	30	7.59 406	7.59 406	10.00000	30
40 7.02 800	7.02 800	7.02 800	10.00000	20	40	7.59 939	7.59 939	10.00000	20
50 7.04 730	7.04 730	7.04 730	10.00000	10	50	7.60 465	7.60 466	10.00000	10
4 0 7.06 579	7.06 579	7.06 579	10.00000	0 56	14 0	7.60 985	7.60 986	10.00000	0 46
10 7.08 351	7.08 352	7.08 352	10.00000	50	10	7.61 499	7.61 500	10.00000	50
20 7.10 055	7.10 055	7.10 055	10.00000	40	20	7.62 007	7.62 008	10.00000	40
30 7.11 694	7.11 694	7.11 694	10.00000	30	30	7.62 509	7.62 510	10.00000	30
40 7.13 273	7.13 273	7.13 273	10.00000	20	40	7.63 006	7.63 006	10.00000	20
50 7.14 797	7.14 797	7.14 797	10.00000	10	50	7.63 496	7.63 497	10.00000	10
5 0 7.16 270	7.16 270	7.16 270	10.00000	0 55	15 0	7.63 982	7.63 982	10.00000	0 45
10 7.17 694	7.17 694	7.17 694	10.00000	50	10	7.64 461	7.64 462	10.00000	50
20 7.19 072	7.19 073	7.19 073	10.00000	40	20	7.64 936	7.64 937	10.00000	40
30 7.20 409	7.20 409	7.20 409	10.00000	30	30	7.65 406	7.65 406	10.00000	30
40 7.21 705	7.21 705	7.21 705	10.00000	20	40	7.65 870	7.65 871	10.00000	20
50 7.22 964	7.22 964	7.22 964	10.00000	10	50	7.66 330	7.66 330	10.00000	10
6 0 7.24 188	7.24 188	7.24 188	10.00000	0 54	16 0	7.66 784	7.66 785	10.00000	0 44
10 7.25 378	7.25 378	7.25 378	10.00000	50	10	7.67 235	7.67 235	10.00000	50
20 7.26 536	7.26 536	7.26 536	10.00000	40	20	7.67 680	7.67 680	10.00000	40
30 7.27 664	7.27 664	7.27 664	10.00000	30	30	7.68 121	7.68 121	10.00000	30
40 7.28 763	7.28 763	7.28 763	10.00000	20	40	7.68 557	7.68 558	9.99999	20
50 7.29 836	7.29 836	7.29 836	10.00000	10	50	7.68 989	7.68 990	9.99999	10
7 0 7.30 882	7.30 882	7.30 882	10.00000	0 53	17 0	7.69 417	7.69 418	9.99 999	0 43
10 7.31 904	7.31 904	7.31 904	10.00000	50	10	7.69 841	7.69 842	9.99 999	50
20 7.32 903	7.32 903	7.32 903	10.00000	40	20	7.70 261	7.70 261	9.99 999	40
30 7.33 879	7.33 879	7.33 879	10.00000	30	30	7.70 676	7.70 677	9.99 999	30
40 7.34 833	7.34 833	7.34 833	10.00000	20	40	7.71 088	7.71 088	9.99 999	20
50 7.35 767	7.35 767	7.35 767	10.00000	10	50	7.71 496	7.71 496	9.99 999	10
8 0 7.36 682	7.36 682	7.36 682	10.00000	0 52	18 0	7.71 900	7.71 900	9.99 999	0 42
10 7.37 577	7.37 577	7.37 577	10.00000	50	10	7.72 300	7.72 301	9.99 999	50
20 7.38 454	7.38 455	7.38 455	10.00000	40	20	7.72 697	7.72 697	9.99 999	40
30 7.39 314	7.39 315	7.39 315	10.00000	30	30	7.73 090	7.73 090	9.99 999	30
40 7.40 158	7.40 158	7.40 158	10.00000	20	40	7.73 479	7.73 480	9.99 999	20
50 7.40 985	7.40 985	7.40 985	10.00000	10	50	7.73 865	7.73 866	9.99 999	10
9 0 7.41 797	7.41 797	7.41 797	10.00000	0 51	19 0	7.74 248	7.74 248	9.99 999	0 41
10 7.42 594	7.42 594	7.42 594	10.00000	50	10	7.74 627	7.74 628	9.99 999	50
20 7.43 376	7.43 376	7.43 376	10.00000	40	20	7.75 003	7.75 004	9.99 999	40
30 7.44 145	7.44 145	7.44 145	10.00000	30	30	7.75 376	7.75 377	9.99 999	30
40 7.44 900	7.44 900	7.44 900	10.00000	20	40	7.75 745	7.75 746	9.99 999	20
50 7.45 643	7.45 643	7.45 643	10.00000	10	50	7.76 112	7.76 113	9.99 999	10
10 0 7.46 373	7.46 373	7.46 373	10.00000	0 50	20 0	7.76 475	7.76 476	9.99 999	0 40
111 L Cos	L Cot	L Sin	111	111	L Cos	L Cot	L Sin	111	

0°

1 111	L Sin	L Tan	L Cos	1 111	1 111	L Sin	L Tan	L Cos	1 111
20 0	7.76 475	7.76 476	9.99 999	0 40	30 0	7.94 084	7.94 086	9.99 998	0 30
10	7.76 836	7.76 837	9.99 999	50	10	7.94 325	7.94 326	9.99 998	50
20	7.77 193	7.77 194	9.99 999	40	20	7.94 564	7.94 566	9.99 998	40
30	7.77 548	7.77 549	9.99 999	30	30	7.94 802	7.94 804	9.99 998	30
40	7.77 899	7.77 900	9.99 999	20	40	7.95 039	7.95 040	9.99 998	20
50	7.78 248	7.78 249	9.99 999	10	50	7.95 274	7.95 276	9.99 998	10
21 0	7.78 594	7.78 595	9.99 999	0 39	31 0	7.95 508	7.95 510	9.99 998	0 29
10	7.78 938	7.78 938	9.99 999	50	10	7.95 741	7.95 743	9.99 998	50
20	7.79 278	7.79 279	9.99 999	40	20	7.95 973	7.95 974	9.99 998	40
30	7.79 616	7.79 617	9.99 999	30	30	7.96 203	7.96 205	9.99 998	30
40	7.79 952	7.79 952	9.99 999	20	40	7.96 432	7.96 434	9.99 998	20
50	7.80 284	7.80 285	9.99 999	10	50	7.96 660	7.96 662	9.99 998	10
22 0	7.80 615	7.80 615	9.99 999	0 38	32 0	7.96 887	7.96 889	9.99 998	0 28
10	7.80 942	7.80 943	9.99 999	50	10	7.97 113	7.97 114	9.99 998	50
20	7.81 268	7.81 269	9.99 999	40	20	7.97 337	7.97 339	9.99 998	40
30	7.81 591	7.81 591	9.99 999	30	30	7.97 560	7.97 562	9.99 998	30
40	7.81 911	7.81 912	9.99 999	20	40	7.97 782	7.97 784	9.99 998	20
50	7.82 229	7.82 230	9.99 999	10	50	7.98 003	7.98 005	9.99 998	10
23 0	7.82 545	7.82 546	9.99 999	0 37	33 0	7.98 223	7.98 225	9.99 998	0 27
10	7.82 859	7.82 860	9.99 999	50	10	7.98 442	7.98 444	9.99 998	50
20	7.83 170	7.83 171	9.99 999	40	20	7.98 660	7.98 662	9.99 998	40
30	7.83 479	7.83 480	9.99 999	30	30	7.98 876	7.98 878	9.99 998	30
40	7.83 786	7.83 787	9.99 999	20	40	7.99 092	7.99 094	9.99 998	20
50	7.84 091	7.84 092	9.99 999	10	50	7.99 306	7.99 308	9.99 998	10
24 0	7.84 393	7.84 394	9.99 999	0 36	34 0	7.99 520	7.99 522	9.99 998	0 26
10	7.84 694	7.84 695	9.99 999	50	10	7.99 732	7.99 734	9.99 998	50
20	7.84 992	7.84 993	9.99 999	40	20	7.99 943	7.99 946	9.99 998	40
30	7.85 285	7.85 290	9.99 999	30	30	8.00 154	8.00 156	9.99 998	30
40	7.85 583	7.85 584	9.99 999	20	40	8.00 363	8.00 365	9.99 998	20
50	7.85 876	7.85 877	9.99 999	10	50	8.00 571	8.00 574	9.99 998	10
25 0	7.86 166	7.86 167	9.99 999	0 35	35 0	8.00 779	8.00 781	9.99 998	0 25
10	7.86 455	7.86 456	9.99 999	50	10	8.00 985	8.00 987	9.99 998	50
20	7.86 741	7.86 743	9.99 999	40	20	8.01 190	8.01 193	9.99 998	40
30	7.87 026	7.87 027	9.99 999	30	30	8.01 395	8.01 397	9.99 998	30
40	7.87 309	7.87 310	9.99 999	20	40	8.01 598	8.01 600	9.99 998	20
50	7.87 590	7.87 591	9.99 999	10	50	8.01 801	8.01 803	9.99 998	10
26 0	7.87 870	7.87 871	9.99 999	0 34	36 0	8.02 002	8.02 004	9.99 998	0 24
10	7.88 147	7.88 148	9.99 999	50	10	8.02 203	8.02 205	9.99 998	50
20	7.88 423	7.88 424	9.99 999	40	20	8.02 402	8.02 405	9.99 998	40
30	7.88 697	7.88 698	9.99 999	30	30	8.02 601	8.02 604	9.99 998	30
40	7.88 969	7.88 970	9.99 999	20	40	8.02 799	8.02 801	9.99 998	20
50	7.89 240	7.89 241	9.99 999	10	50	8.02 996	8.02 998	9.99 998	10
27 0	7.89 509	7.89 510	9.99 999	0 33	37 0	8.03 192	8.03 194	9.99 997	0 23
10	7.89 770	7.89 777	9.99 999	50	10	8.03 387	8.03 390	9.99 997	50
20	7.90 041	7.90 043	9.99 999	40	20	8.03 581	8.03 584	9.99 997	40
30	7.90 305	7.90 307	9.99 999	30	30	8.03 775	8.03 777	9.99 997	30
40	7.90 568	7.90 569	9.99 999	20	40	8.03 967	8.03 970	9.99 997	20
50	7.90 829	7.90 830	9.99 999	10	50	8.04 159	8.04 162	9.99 997	10
28 0	7.91 088	7.91 089	9.99 999	0 32	38 0	8.04 350	8.04 353	9.99 997	0 22
10	7.91 346	7.91 347	9.99 999	50	10	8.04 540	8.04 543	9.99 997	50
20	7.91 602	7.91 603	9.99 999	40	20	8.04 729	8.04 732	9.99 997	40
30	7.91 857	7.91 858	9.99 999	30	30	8.04 918	8.04 921	9.99 997	30
40	7.92 110	7.92 111	9.99 998	20	40	8.05 105	8.05 108	9.99 997	20
50	7.92 362	7.92 363	9.99 998	10	50	8.05 292	8.05 295	9.99 997	10
29 0	7.92 612	7.92 613	9.99 998	0 31	39 0	8.05 478	8.05 481	9.99 997	0 21
10	7.92 861	7.92 862	9.99 998	50	10	8.05 663	8.05 666	9.99 997	50
20	7.93 108	7.93 110	9.99 998	40	20	8.05 848	8.05 851	9.99 997	40
30	7.93 354	7.93 356	9.99 998	30	30	8.06 031	8.06 034	9.99 997	30
40	7.93 599	7.93 601	9.99 998	20	40	8.06 214	8.06 217	9.99 997	20
50	7.93 842	7.93 844	9.99 998	10	50	8.06 396	8.06 399	9.99 997	10
30 0	7.94 084	7.94 086	9.99 998	0 30	40 0	8.06 578	8.06 581	9.99 997	0 20

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111	L Sin	L Tan	L Cos	111	111	L Sin	L Tan	L Cos	111
40 0	8.06 578	8.06 581	9.99 997	0 20	50 0	8.16 268	8.16 273	9.99 995	0 10
10	8.06 755	8.06 761	9.99 997	50	10	8.16 413	8.16 417	9.99 995	50
20	8.06 938	8.06 941	9.99 997	40	20	8.16 557	8.16 561	9.99 995	40
30	8.07 117	8.07 120	9.99 997	30	30	8.16 700	8.16 705	9.99 995	30
40	8.07 295	8.07 299	9.99 997	20	40	8.16 843	8.16 848	9.99 995	20
50	8.07 473	8.07 476	9.99 997	10	50	8.16 986	8.16 991	9.99 995	10
41 0	8.07 650	8.07 653	9.99 997	0 19	51 0	8.17 128	8.17 133	9.99 995	0 9
10	8.07 826	8.07 829	9.99 997	50	10	8.17 270	8.17 275	9.99 995	50
20	8.08 002	8.08 005	9.99 997	40	20	8.17 411	8.17 416	9.99 995	40
30	8.08 176	8.08 180	9.99 997	30	30	8.17 552	8.17 557	9.99 995	30
40	8.08 350	8.08 354	9.99 997	20	40	8.17 692	8.17 697	9.99 995	20
50	8.08 524	8.08 527	9.99 997	10	50	8.17 832	8.17 837	9.99 995	10
42 0	8.08 696	8.08 700	9.99 997	0 18	52 0	8.17 971	8.17 976	9.99 995	0 8
10	8.08 868	8.08 872	9.99 997	50	10	8.18 110	8.18 115	9.99 995	50
20	8.09 040	8.09 043	9.99 997	40	20	8.18 249	8.18 254	9.99 995	40
30	8.09 210	8.09 214	9.99 997	30	30	8.18 387	8.18 392	9.99 995	30
40	8.09 380	8.09 384	9.99 997	20	40	8.18 524	8.18 530	9.99 995	20
50	8.09 550	8.09 553	9.99 997	10	50	8.18 662	8.18 667	9.99 995	10
43 0	8.09 718	8.09 722	9.99 997	0 17	53 0	8.18 798	8.18 804	9.99 995	0 7
10	8.09 886	8.09 890	9.99 997	50	10	8.18 935	8.18 940	9.99 995	50
20	8.10 054	8.10 057	9.99 997	40	20	8.19 071	8.19 076	9.99 995	40
30	8.10 220	8.10 224	9.99 997	30	30	8.19 206	8.19 212	9.99 995	30
40	8.10 386	8.10 390	9.99 997	20	40	8.19 341	8.19 347	9.99 995	20
50	8.10 552	8.10 555	9.99 997	10	50	8.19 476	8.19 481	9.99 995	10
44 0	8.10 717	8.10 720	9.99 996	0 16	54 0	8.19 610	8.19 616	9.99 905	0 6
10	8.10 881	8.10 884	9.99 996	50	10	8.19 744	8.19 749	9.99 995	50
20	8.11 044	8.11 048	9.99 996	40	20	8.19 877	8.19 883	9.99 995	40
30	8.11 207	8.11 211	9.99 996	30	30	8.20 010	8.20 016	9.99 995	30
40	8.11 370	8.11 373	9.99 996	20	40	8.20 143	8.20 149	9.99 995	20
50	8.11 531	8.11 535	9.99 996	10	50	8.20 275	8.20 281	9.99 994	10
45 0	8.11 693	8.11 696	9.99 996	0 15	55 0	8.20 407	8.20 413	9.99 994	0 5
10	8.11 853	8.11 857	9.99 996	50	10	8.20 538	8.20 544	9.99 994	50
20	8.12 013	8.12 017	9.99 996	40	20	8.20 669	8.20 675	9.99 994	40
30	8.12 172	8.12 176	9.99 996	30	30	8.20 800	8.20 806	9.99 994	30
40	8.12 331	8.12 335	9.99 996	20	40	8.20 930	8.20 936	9.99 994	20
50	8.12 489	8.12 493	9.99 996	10	50	8.21 060	8.21 066	9.99 994	10
46 0	8.12 647	8.12 651	9.99 996	0 14	56 0	8.21 189	8.21 195	9.99 994	0 4
10	8.12 804	8.12 808	9.99 996	50	10	8.21 319	8.21 324	9.99 994	50
20	8.12 961	8.12 965	9.99 996	40	20	8.21 447	8.21 453	9.99 994	40
30	8.13 117	8.13 121	9.99 996	30	30	8.21 576	8.21 581	9.99 994	30
40	8.13 272	8.13 276	9.99 996	20	40	8.21 703	8.21 709	9.99 994	20
50	8.13 427	8.13 431	9.99 996	10	50	8.21 831	8.21 837	9.99 994	10
47 0	8.13 581	8.13 585	9.99 996	0 13	57 0	8.21 958	8.21 964	9.99 994	0 3
10	8.13 735	8.13 739	9.99 996	50	10	8.22 085	8.22 091	9.99 994	50
20	8.13 888	8.13 892	9.99 996	40	20	8.22 211	8.22 217	9.99 994	40
30	8.14 041	8.14 045	9.99 996	30	30	8.22 337	8.22 343	9.99 994	30
40	8.14 194	8.14 197	9.99 996	20	40	8.22 463	8.22 469	9.99 994	20
50	8.14 344	8.14 348	9.99 996	10	50	8.22 588	8.22 595	9.99 994	10
48 0	8.14 495	8.14 500	9.99 996	0 12	58 0	8.22 713	8.22 720	9.99 994	0 2
10	8.14 646	8.14 650	9.99 996	50	10	8.22 838	8.22 844	9.99 994	50
20	8.14 795	8.14 800	9.99 996	40	20	8.22 962	8.22 968	9.99 994	40
30	8.14 945	8.14 950	9.99 996	30	30	8.23 086	8.23 092	9.99 994	30
40	8.15 094	8.15 099	9.99 996	20	40	8.23 210	8.23 216	9.99 994	20
50	8.15 243	8.15 247	9.99 996	10	50	8.23 333	8.23 339	9.99 994	10
49 0	8.15 391	8.15 395	9.99 996	0 11	59 0	8.23 456	8.23 462	9.99 994	0 1
10	8.15 538	8.15 543	9.99 996	50	10	8.23 578	8.23 585	9.99 994	50
20	8.15 685	8.15 690	9.99 996	40	20	8.23 700	8.23 707	9.99 994	40
30	8.15 832	8.15 836	9.99 996	30	30	8.23 822	8.23 829	9.99 993	30
40	8.15 978	8.15 982	9.99 995	20	40	8.23 944	8.23 950	9.99 993	20
50	8.16 123	8.16 128	9.99 995	10	50	8.24 065	8.24 071	9.99 993	10
50 0	8.16 268	8.16 273	9.99 995	0 10	60 0	8.24 186	8.24 192	9.99 993	0 0
111	L Cos	L Cot	L Sin	111	111	L Cos	L Cot	L Sin	111

111	L Sin	L Tan	L Cos	111	111	L Sin	L Tan	L Cos	111
0 0 8.24 186	8.24 192	9.99 993	0 60	10 0 8.30 879	8.30 883	9.99 991	0 50		
10 8.24 306	8.24 313	9.99 993	50	10 8.30 953	8.30 992	9.99 991	50		
20 8.24 426	8.24 433	9.99 993	40	20 8.31 056	8.31 095	9.99 991	40		
30 8.24 546	8.24 553	9.99 993	30	30 8.31 158	8.31 195	9.99 991	30		
40 8.24 665	8.24 672	9.99 993	20	40 8.31 291	8.31 300	9.99 991	20		
50 8.24 785	8.24 791	9.99 993	10	50 8.31 393	8.31 403	9.99 991	10		
1 0 8.24 903	8.24 910	9.99 993	0 59	11 0 8.31 495	8.31 505	9.99 991	0 49		
10 8.25 022	8.25 029	9.99 993	50	10 8.31 597	8.31 606	9.99 991	50		
20 8.25 140	8.25 147	9.99 993	40	20 8.31 699	8.31 708	9.99 991	40		
30 8.25 258	8.25 265	9.99 993	30	30 8.31 800	8.31 809	9.99 991	30		
40 8.25 375	8.25 382	9.99 993	20	40 8.31 901	8.31 911	9.99 991	20		
50 8.25 493	8.25 500	9.99 993	10	50 8.32 002	8.32 012	9.99 991	10		
2 0 8.25 609	8.25 616	9.99 993	0 58	12 0 8.32 103	8.32 112	9.99 990	0 48		
10 8.25 726	8.25 733	9.99 993	50	10 8.32 203	8.32 213	9.99 990	50		
20 8.25 842	8.25 849	9.99 993	40	20 8.32 303	8.32 313	9.99 990	40		
30 8.25 958	8.25 965	9.99 993	30	30 8.32 403	8.32 413	9.99 990	30		
40 8.26 074	8.26 081	9.99 993	20	40 8.32 503	8.32 513	9.99 990	20		
50 8.26 189	8.26 196	9.99 993	10	50 8.32 602	8.32 612	9.99 990	10		
3 0 8.26 304	8.26 312	9.99 993	0 57	13 0 8.32 702	8.32 711	9.99 990	0 47		
10 8.26 419	8.26 426	9.99 993	50	10 8.32 801	8.32 811	9.99 990	50		
20 8.26 533	8.26 541	9.99 993	40	20 8.32 899	8.32 909	9.99 990	40		
30 8.26 648	8.26 655	9.99 993	30	30 8.32 993	8.33 003	9.99 990	30		
40 8.26 761	8.26 769	9.99 993	20	40 8.33 096	8.33 106	9.99 990	20		
50 8.26 875	8.26 882	9.99 993	10	50 8.33 195	8.33 205	9.99 990	10		
4 0 8.26 988	8.26 996	9.99 992	0 56	14 0 8.33 292	8.33 302	9.99 990	0 46		
10 8.27 101	8.27 109	9.99 992	50	10 8.33 390	8.33 400	9.99 990	50		
20 8.27 214	8.27 221	9.99 992	40	20 8.33 488	8.33 498	9.99 990	40		
30 8.27 326	8.27 334	9.99 992	30	30 8.33 585	8.33 595	9.99 990	30		
40 8.27 438	8.27 446	9.99 992	20	40 8.33 682	8.33 692	9.99 990	20		
50 8.27 550	8.27 558	9.99 992	10	50 8.33 779	8.33 789	9.99 990	10		
5 0 8.27 661	8.27 669	9.99 992	0 55	15 0 8.33 875	8.33 886	9.99 990	0 45		
10 8.27 773	8.27 780	9.99 992	50	10 8.33 972	8.33 982	9.99 990	50		
20 8.27 883	8.27 891	9.99 992	40	20 8.34 068	8.34 078	9.99 990	40		
30 8.27 994	8.28 002	9.99 992	30	30 8.34 164	8.34 174	9.99 990	30		
40 8.28 104	8.28 112	9.99 992	20	40 8.34 260	8.34 270	9.99 989	20		
50 8.28 215	8.28 223	9.99 992	10	50 8.34 355	8.34 366	9.99 989	10		
6 0 8.28 324	8.28 332	9.99 992	0 54	16 0 8.34 450	8.34 461	9.99 989	0 44		
10 8.28 434	8.28 442	9.99 992	50	10 8.34 546	8.34 556	9.99 989	50		
20 8.28 543	8.28 551	9.99 992	40	20 8.34 640	8.34 651	9.99 989	40		
30 8.28 652	8.28 660	9.99 992	30	30 8.34 735	8.34 746	9.99 989	30		
40 8.28 761	8.28 769	9.99 992	20	40 8.34 830	8.34 840	9.99 989	20		
50 8.28 869	8.28 877	9.99 992	10	50 8.34 924	8.34 935	9.99 989	10		
7 0 8.28 977	8.28 986	9.99 992	0 53	17 0 8.35 018	8.35 029	9.99 989	0 43		
10 8.29 085	8.29 094	9.99 992	50	10 8.35 112	8.35 123	9.99 989	50		
20 8.29 193	8.29 201	9.99 992	40	20 8.35 206	8.35 217	9.99 989	40		
30 8.29 300	8.29 309	9.99 992	30	30 8.35 299	8.35 310	9.99 989	30		
40 8.29 407	8.29 416	9.99 992	20	40 8.35 392	8.35 403	9.99 989	20		
50 8.29 514	8.29 523	9.99 992	10	50 8.35 485	8.35 497	9.99 989	10		
8 0 8.29 621	8.29 629	9.99 992	0 52	18 0 8.35 578	8.35 590	9.99 989	0 42		
10 8.29 727	8.29 736	9.99 991	50	10 8.35 671	8.35 682	9.99 989	50		
20 8.29 833	8.29 842	9.99 991	40	20 8.35 764	8.35 775	9.99 989	40		
30 8.29 939	8.29 947	9.99 991	30	30 8.35 856	8.35 867	9.99 989	30		
40 8.30 044	8.30 053	9.99 991	20	40 8.35 948	8.35 959	9.99 989	20		
50 8.30 150	8.30 158	9.99 991	10	50 8.36 040	8.36 051	9.99 989	10		
9 0 8.30 255	8.30 263	9.99 991	0 51	19 0 8.36 131	8.36 143	9.99 989	0 41		
10 8.30 359	8.30 368	9.99 991	50	10 8.36 223	8.36 235	9.99 988	50		
20 8.30 464	8.30 473	9.99 991	40	20 8.36 314	8.36 326	9.99 988	40		
30 8.30 568	8.30 577	9.99 991	30	30 8.36 405	8.36 417	9.99 988	30		
40 8.30 672	8.30 681	9.99 991	20	40 8.36 496	8.36 508	9.99 988	20		
50 8.30 776	8.30 785	9.99 991	10	50 8.36 587	8.36 599	9.99 988	10		
10 0 8.30 879	8.30 888	9.99 991	0 50	20 0 8.36 678	8.36 689	9.99 988	0 40		
111 L Cos	L Cot	L Sin	111	111 L Cos	L Cot	L Sin	111		

1 11	L Sin	L Tan	L Cos	1 11	1 11	L Sin	L Tan	L Cos	1 11
1 11	L Cos	L Cot	L Sin	1 11	1 11	L Cos	L Cot	L Sin	1 11
20 0	8.36 678	8.36 689	9.99 988	0 40	30 0	8.41 792	8.41 807	9.99 985	0 30
10	8.36 768	8.36 780	9.99 988	50	10	8.41 872	8.41 887	9.99 985	50
20	8.36 858	8.36 870	9.99 988	40	20	8.41 952	8.41 967	9.99 985	40
30	8.36 948	8.36 960	9.99 988	30	30	8.42 032	8.42 048	9.99 985	30
40	8.37 038	8.37 050	9.99 988	20	40	8.42 112	8.42 127	9.99 985	20
50	8.37 128	8.37 140	9.99 988	10	50	8.42 192	8.42 207	9.99 985	10
21 0	8.37 217	8.37 229	9.99 988	0 39	31 0	8.42 272	8.42 287	9.99 985	0 29
10	8.37 306	8.37 318	9.99 988	50	10	8.42 351	8.42 366	9.99 985	50
20	8.37 395	8.37 408	9.99 988	40	20	8.42 430	8.42 446	9.99 985	40
30	8.37 484	8.37 497	9.99 988	30	30	8.42 510	8.42 525	9.99 985	30
40	8.37 573	8.37 585	9.99 988	20	40	8.42 589	8.42 606	9.99 985	20
50	8.37 662	8.37 674	9.99 988	10	50	8.42 667	8.42 683	9.99 985	10
22 0	8.37 750	8.37 762	9.99 988	0 38	32 0	8.42 746	8.42 762	9.99 984	0 28
10	8.37 838	8.37 850	9.99 988	50	10	8.42 825	8.42 840	9.99 984	50
20	8.37 926	8.37 938	9.99 988	40	20	8.42 903	8.42 919	9.99 984	40
30	8.38 014	8.38 026	9.99 987	30	30	8.42 982	8.42 997	9.99 984	30
40	8.38 101	8.38 114	9.99 987	20	40	8.43 060	8.43 075	9.99 984	20
50	8.38 189	8.38 202	9.99 987	10	50	8.43 138	8.43 154	9.99 984	10
23 0	8.38 276	8.38 289	9.99 987	0 37	33 0	8.43 216	8.43 232	9.99 984	0 27
10	8.38 363	8.38 376	9.99 987	50	10	8.43 293	8.43 309	9.99 984	50
20	8.38 450	8.38 463	9.99 987	40	20	8.43 371	8.43 387	9.99 984	40
30	8.38 537	8.38 550	9.99 987	30	30	8.43 448	8.43 464	9.99 984	30
40	8.38 624	8.38 636	9.99 987	20	40	8.43 526	8.43 542	9.99 984	20
50	8.38 710	8.38 723	9.99 987	10	50	8.43 603	8.43 619	9.99 984	10
24 0	8.38 796	8.38 809	9.99 987	0 36	34 0	8.43 680	8.43 696	9.99 984	0 26
10	8.38 882	8.38 895	9.99 987	50	10	8.43 757	8.43 773	9.99 984	50
20	8.38 968	8.38 981	9.99 987	40	20	8.43 834	8.43 850	9.99 984	40
30	8.39 054	8.39 067	9.99 987	30	30	8.43 910	8.43 927	9.99 984	30
40	8.39 139	8.39 153	9.99 987	20	40	8.43 987	8.44 003	9.99 984	20
50	8.39 225	8.39 238	9.99 987	10	50	8.44 063	8.44 080	9.99 983	10
25 0	8.39 310	8.39 323	9.99 987	0 35	35 0	8.44 139	8.44 156	9.99 983	0 25
10	8.39 395	8.39 408	9.99 987	50	10	8.44 216	8.44 232	9.99 983	50
20	8.39 480	8.39 493	9.99 987	40	20	8.44 292	8.44 308	9.99 983	40
30	8.39 565	8.39 587	9.99 987	30	30	8.44 367	8.44 384	9.99 983	30
40	8.39 649	8.39 663	9.99 987	20	40	8.44 443	8.44 460	9.99 983	20
50	8.39 734	8.39 747	9.99 986	10	50	8.44 519	8.44 536	9.99 983	10
26 0	8.39 818	8.39 832	9.99 986	0 34	36 0	8.44 594	8.44 611	9.99 983	0 24
10	8.39 902	8.39 916	9.99 986	50	10	8.44 669	8.44 686	9.99 983	50
20	8.39 986	8.40 000	9.99 986	40	20	8.44 745	8.44 762	9.99 983	40
30	8.40 070	8.40 083	9.99 986	30	30	8.44 820	8.44 837	9.99 983	30
40	8.40 153	8.40 167	9.99 986	20	40	8.44 895	8.44 912	9.99 983	20
50	8.40 237	8.40 251	9.99 986	10	50	8.44 969	8.44 987	9.99 983	10
27 0	8.40 320	8.40 334	9.99 986	0 33	37 0	8.45 044	8.45 061	9.99 983	0 23
10	8.40 403	8.40 417	9.99 986	50	10	8.45 119	8.45 136	9.99 983	50
20	8.40 486	8.40 500	9.99 986	40	20	8.45 193	8.45 210	9.99 983	40
30	8.40 569	8.40 583	9.99 986	30	30	8.45 267	8.45 285	9.99 983	30
40	8.40 651	8.40 665	9.99 986	20	40	8.45 341	8.45 359	9.99 982	20
50	8.40 734	8.40 748	9.99 986	10	50	8.45 415	8.45 433	9.99 982	10
28 0	8.40 816	8.40 830	9.99 986	0 32	38 0	8.45 480	8.45 507	9.99 982	0 22
10	8.40 898	8.40 913	9.99 986	50	10	8.45 563	8.45 581	9.99 982	50
20	8.40 980	8.40 995	9.99 986	40	20	8.45 637	8.45 655	9.99 982	40
30	8.41 062	8.41 077	9.99 986	30	30	8.45 710	8.45 728	9.99 982	30
40	8.41 144	8.41 158	9.99 986	20	40	8.45 784	8.45 802	9.99 982	20
50	8.41 225	8.41 240	9.99 986	10	50	8.45 857	8.45 875	9.99 982	10
29 0	8.41 307	8.41 321	9.99 985	0 31	39 0	8.45 930	8.45 948	9.99 982	0 21
10	8.41 388	8.41 403	9.99 985	50	10	8.46 003	8.46 021	9.99 982	50
20	8.41 469	8.41 484	9.99 985	40	20	8.46 076	8.46 094	9.99 982	40
30	8.41 550	8.41 565	9.99 985	30	30	8.46 149	8.46 167	9.99 982	30
40	8.41 631	8.41 646	9.99 985	20	40	8.46 222	8.46 240	9.99 982	20
50	8.41 711	8.41 726	9.99 985	10	50	8.46 294	8.46 312	9.99 982	10
30 0	8.41 792	8.41 807	9.99 985	0 30	40 0	8.46 366	8.46 385	9.99 982	0 20

1 11	L Sin	L Tan	L Cos	11 1	1 11	L Sin	L Tan	L Cos	11 1
40 0	8.46 366	8.46 385	9.99 982	0 20	50 0	8.50 504	8.50 527	9.99 978	0 10
10	8.46 439	8.46 457	9.99 982	50	10	8.50 570	8.50 593	9.99 978	50
20	8.46 511	8.46 529	9.99 982	40	20	8.50 636	8.50 658	9.99 978	40
30	8.46 583	8.46 602	9.99 981	30	30	8.50 701	8.50 724	9.99 978	30
40	8.46 655	8.46 674	9.99 981	20	40	8.50 767	8.50 789	9.99 977	20
50	8.46 727	8.46 745	9.99 981	10	50	8.50 832	8.50 855	9.99 977	10
41 0	8.46 799	8.46 817	9.99 981	0 19	51 0	8.50 897	8.50 920	9.99 977	0 9
10	8.46 870	8.46 889	9.99 981	50	10	8.50 963	8.50 985	9.99 977	50
20	8.46 942	8.46 960	9.99 981	40	20	8.51 028	8.51 050	9.99 977	40
30	8.47 013	8.47 032	9.99 981	30	30	8.51 092	8.51 015	9.99 977	30
40	8.47 084	8.47 103	9.99 981	20	40	8.51 157	8.51 180	9.99 977	20
50	8.47 155	8.47 174	9.99 981	10	50	8.51 222	8.51 245	9.99 977	10
42 0	8.47 226	8.47 245	9.99 981	0 18	52 0	8.51 287	8.51 310	9.99 977	0 8
10	8.47 297	8.47 316	9.99 981	50	10	8.51 351	8.51 374	9.99 977	50
20	8.47 368	8.47 387	9.99 981	40	20	8.51 416	8.51 439	9.99 977	40
30	8.47 439	8.47 458	9.99 981	30	30	8.51 480	8.51 503	9.99 977	30
40	8.47 509	8.47 528	9.99 981	20	40	8.51 544	8.51 568	9.99 977	20
50	8.47 580	8.47 599	9.99 981	10	50	8.51 609	8.51 632	9.99 977	10
43 0	8.47 650	8.47 669	9.99 981	0 17	53 0	8.51 673	8.51 696	9.99 977	0 7
10	8.47 720	8.47 740	9.99 980	50	10	8.51 737	8.51 760	9.99 976	50
20	8.47 790	8.47 810	9.99 980	40	20	8.51 801	8.51 824	9.99 976	40
30	8.47 860	8.47 880	9.99 980	30	30	8.51 864	8.51 888	9.99 976	30
40	8.47 930	8.47 950	9.99 980	20	40	8.51 928	8.51 952	9.99 976	20
50	8.48 000	8.48 020	9.99 980	10	50	8.51 992	8.52 015	9.99 976	10
44 0	8.48 096	8.48 090	9.99 980	0 16	54 0	8.52 055	8.52 079	9.99 976	0 6
10	8.48 139	8.48 159	9.99 980	50	10	8.52 119	8.52 143	9.99 976	50
20	8.48 208	8.48 228	9.99 980	40	20	8.52 182	8.52 206	9.99 976	40
30	8.48 278	8.48 298	9.99 980	30	30	8.52 245	8.52 269	9.99 976	30
40	8.48 347	8.48 367	9.99 980	20	40	8.52 308	8.52 332	9.99 976	20
50	8.48 416	8.48 436	9.99 980	10	50	8.52 371	8.52 396	9.99 976	10
45 0	8.48 485	8.48 505	9.99 980	0 15	55 0	8.52 434	8.52 459	9.99 976	0 5
10	8.48 554	8.48 574	9.99 980	50	10	8.52 497	8.52 522	9.99 976	50
20	8.48 622	8.48 643	9.99 980	40	20	8.52 560	8.52 584	9.99 976	40
30	8.48 691	8.48 711	9.99 980	30	30	8.52 623	8.52 647	9.99 975	30
40	8.48 760	8.48 780	9.99 979	20	40	8.52 685	8.52 710	9.99 975	20
50	8.48 828	8.48 849	9.99 979	10	50	8.52 748	8.52 772	9.99 975	10
46 0	8.48 896	8.48 917	9.99 979	0 14	56 0	8.52 810	8.52 835	9.99 975	0 4
10	8.48 965	8.48 985	9.99 979	50	10	8.52 872	8.52 897	9.99 975	50
20	8.49 033	8.49 053	9.99 979	40	20	8.52 935	8.52 960	9.99 975	40
30	8.49 101	8.49 121	9.99 979	30	30	8.52 997	8.53 022	9.99 975	30
40	8.49 169	8.49 189	9.99 979	20	40	8.53 059	8.53 084	9.99 975	20
50	8.49 236	8.49 257	9.99 979	10	50	8.53 121	8.53 146	9.99 975	10
47 0	8.49 304	8.49 325	9.99 979	0 13	57 0	8.53 183	8.53 208	9.99 975	0 3
10	8.49 372	8.49 393	9.99 979	50	10	8.53 245	8.53 270	9.99 975	50
20	8.49 439	8.49 460	9.99 979	40	20	8.53 306	8.53 332	9.99 975	40
30	8.49 506	8.49 528	9.99 979	30	30	8.53 368	8.53 393	9.99 975	30
40	8.49 574	8.49 595	9.99 979	20	40	8.53 429	8.53 455	9.99 975	20
50	8.49 641	8.49 662	9.99 979	10	50	8.53 491	8.53 516	9.99 974	10
48 0	8.49 708	8.49 729	9.99 979	0 12	58 0	8.53 552	8.53 578	9.99 974	0 2
10	8.49 775	8.49 796	9.99 979	50	10	8.53 614	8.53 639	9.99 974	50
20	8.49 842	8.49 863	9.99 978	40	20	8.53 675	8.53 700	9.99 974	40
30	8.49 908	8.49 930	9.99 978	30	30	8.53 736	8.53 762	9.99 974	30
40	8.49 975	8.49 997	9.99 978	20	40	8.53 797	8.53 823	9.99 974	20
50	8.50 042	8.50 063	9.99 978	10	50	8.53 858	8.53 884	9.99 974	10
49 0	8.50 108	8.50 130	9.99 978	0 11	59 0	8.53 919	8.53 945	9.99 974	0 1
10	8.50 174	8.50 196	9.99 978	50	10	8.53 979	8.54 005	9.99 974	50
20	8.50 241	8.50 263	9.99 978	40	20	8.54 040	8.54 066	9.99 974	40
30	8.50 307	8.50 329	9.99 978	30	30	8.54 101	8.54 127	9.99 974	30
40	8.50 373	8.50 395	9.99 978	20	40	8.54 161	8.54 187	9.99 974	20
50	8.50 439	8.50 461	9.99 978	10	50	8.54 222	8.54 248	9.99 974	10
50 0	8.50 504	8.50 527	9.99 978	0 10	60 0	8.54 282	8.54 308	9.99 974	0 0
1 11	L Cos	L Cot	L Sin	1 11	1 11	L Cos	L Cot	L Sin	1 11

TABLE IV

THE AUXILIARIES S' AND T'

1. If θ is an angle between 0° and 2° and θ' represents the number of minutes in the angle θ , the following formulae involving the quantities S' and T' are convenient.

$$\begin{array}{ll} \log \sin \theta = \log \theta' + S', & \log \theta' = \log \sin \theta - S', \\ \log \tan \theta = \log \theta' + T', & \log \theta' = \log \tan \theta - T', \\ \log \cot \theta = \text{colog} \tan \theta, & \log \theta' = \text{colog} \cot \theta - T'. \end{array}$$

2. If θ is an angle between 88° and 90° and $(90^\circ - \theta)'$ represents the number of minutes in the angle $90^\circ - \theta$, we have

$$\begin{array}{ll} \log \cos \theta = \log (90^\circ - \theta)' + S', & \log (90^\circ - \theta)' = \log \cos \theta - S', \\ \log \cot \theta = \log (90^\circ - \theta)' + T', & \log (90^\circ - \theta)' = \log \cot \theta - T', \\ \log \tan \theta = \text{colog} \cot \theta, & \log (90^\circ - \theta)' = \text{colog} \tan \theta - T'. \end{array}$$

VALUES OF S' AND T'

θ'	S'	$\log \sin \theta$
0	6.46373	—
14	6.46372	7.60985
43	6.46371	8.09718
59	6.46370	8.23456
72	6.46369	8.32103
82	6.46368	8.37750
92	6.46367	8.42746
100	6.46366	8.46366
108	6.46365	8.49708
116	6.46364	8.52810
122	6.46363	8.54999

θ'	T'	$\log \tan \theta$	θ'	T'	$\log \tan \theta$
0	6.46373	—	90	6.46383	8.41807
27	6.46374	7.89510	95	6.46384	8.44156
40	6.46375	8.06581	99	6.46385	8.45948
49	6.46376	8.15395	103	6.46386	8.47669
57	6.46377	8.21964	107	6.46387	8.49325
64	6.46378	8.26996	111	6.46388	8.50920
70	6.46379	8.30888	114	6.46389	8.52079
75	6.46380	8.33886	118	6.46390	8.53578
81	6.46381	8.37229	121	6.46391	8.54669
86	6.46382	8.39832			
90		8.41807			

TABLE V
FOUR-PLACE VALUES
OF THE
NATURAL TRIGONOMETRIC FUNCTIONS
FOR EVERY TENTH OF A DEGREE FROM 0° TO 90°

0° to 3°

Angle	sin	d	Tan	d	Cot	d	Cos	d		P P
0°.0	0.0000	17	0.0000	17	∞		1.0000	0	90°.0	
1	0.0017	18	0.0017	18	572.9572		1.0000	9		
2	0.0035	17	0.0035	18	286.4777		1.0000	8		
3	0.0052	18	0.0052	17	190.9842		1.0000	7		
4	0.0070		0.0070		143.2371		1.0000		6	
5	0.0087	17	0.0087	17	114.5887		1.0000	5		
6	0.0105	18	0.0105	18	95.4895		0.9999	4		18
7	0.0122	18	0.0122	18	81.8470		0.9999	3		
8	0.0140		0.0140		71.6151		0.9999	2		
9	0.0157	17	0.0157	17	63.6567		0.9999	1		
1°.0	0.0175	17	0.0175	17	57.2900		0.9998	6	89°.0	
1	0.0192		0.0192		52.0807		0.9998	7		
2	0.0209	17	0.0209	17	47.7395		0.9998	8		
3	0.0227	18	0.0227	18	44.0661		0.9997	9		
4	0.0244	18	0.0244	18	40.9174		0.9997		6	
5	0.0262		0.0262		38.1885		0.9997	5		
6	0.0279	17	0.0279	17	35.8006		0.9996	4		
7	0.0297		0.0297		33.6935		0.9996	3		
8	0.0314	17	0.0314	17	31.8205		0.9995	2		
9	0.0332	18	0.0332	18	30.1446		0.9995	1		17
2°.0	0.0349	17	0.0349	18	28.6363		0.9994	6	88°.0	
1	0.0366	18	0.0367	17	27.2715		0.9993	7		
2	0.0384	17	0.0384	17	26.0307		0.9993	8		
3	0.0401	18	0.0402	18	24.8978		0.9992	9		
4	0.0419	17	0.0419	18	23.8593	9555	0.9991		5	
5	0.0436	18	0.0437	17	22.9038	8821	0.9990			
6	0.0454	17	0.0454	18	22.0217	8168	0.9990		4	
7	0.0471		0.0472		21.2049	0.9989		3		
8	0.0488	17	0.0489	17	20.4465	7584	0.9988	2		
9	0.0506		0.0507		19.7403	7062	0.9987	1		
3°.0	0.0523		0.0524		19.0811	0.592	0.9986		87°.0	
	Cos	d	Cot	d	Tan	d	sin	d	Angle	P P

87° to 90°

3° to 9°

Angle	Sin	d	Tan	d	Cot	d	Cos	d	PP
3°.0	0.0523	18	0.0524	18	19.0811	6166	0.9986	I	87°.0
1	0.0541	17	0.0542	17	18.4645	5782	0.9985	I	9
2	0.0553	18	0.0559	18	17.8803	5431	0.9984	I	8
3	0.0576	17	0.0577	17	17.3432	5113	0.9983	I	7
4	0.0593	17	0.0594	18	16.8319	4820	0.9982	I	6
5	0.0610	17	0.0612	18	16.3499	4554	0.9981	I	5
6	0.0628	18	0.0629	18	15.8945	4307	0.9980	I	4
7	0.0645	17	0.0647	17	15.4638	4081	0.9979	I	3
8	0.0663	18	0.0664	17	15.0557	3872	0.9978	I	2
9	0.0680	17	0.0682	17	14.6685	3678	0.9977	I	1
4°.0	0.0698	17	0.0699	18	14.3007	3500	0.9976	2	86°.0
1	0.0715	17	0.0717	17	13.9507	3333	0.9974	I	9
2	0.0732	18	0.0734	18	13.6174	3170	0.9973	I	8
3	0.0750	17	0.0752	17	13.2995	3033	0.9972	I	7
4	0.0767	17	0.0769	18	12.9962	2900	0.9971	2	6
5	0.0785	18	0.0787	18	12.7062	2774	0.9969	I	5
6	0.0802	17	0.0805	17	12.4288	2666	0.9968	2	4
7	0.0819	18	0.0822	18	12.1622	2535	0.9966	I	3
8	0.0837	18	0.0840	17	11.9087	2442	0.9965	I	2
9	0.0854	18	0.0857	18	11.6645	2344	0.9963	I	1
5°.0	0.0872	17	0.0875	17	11.4301	2253	0.9962	2	85°.0
1	0.0889	17	0.0892	18	11.2048	2166	0.9960	I	9
2	0.0906	18	0.0910	18	10.9882	2085	0.9959	2	8
3	0.0924	17	0.0928	17	10.7797	2008	0.9957	2	7
4	0.0941	17	0.0945	18	10.5789	1935	0.9956	I	6
5	0.0958	17	0.0963	18	10.3854	1866	0.9954	I	5
6	0.0976	18	0.0981	17	10.1988	1801	0.9952	I	4
7	0.0993	18	0.0998	18	10.0187	1739	0.9951	I	3
8	0.1011	18	0.1016	17	9.8448	1680	0.9949	I	2
9	0.1028	17	0.1033	18	9.6768	1624	0.9947	I	1
6°.0	0.1045	18	0.1051	18	9.5144	1572	0.9945	2	84°.0
1	0.1063	17	0.1069	17	9.3572	1520	0.9943	I	9
2	0.1080	17	0.1086	18	9.2052	1473	0.9942	I	8
3	0.1097	18	0.1104	18	9.0579	1427	0.9940	I	7
4	0.1115	17	0.1122	17	8.9152	1383	0.9938	I	6
5	0.1132	17	0.1139	18	8.7769	1333	0.9936	I	5
6	0.1149	18	0.1157	18	8.6427	1342	0.9934	I	4
7	0.1167	17	0.1175	17	8.5126	1301	0.9932	I	3
8	0.1184	17	0.1192	18	8.3863	1263	0.9930	I	2
9	0.1201	18	0.1210	18	8.2636	1227	0.9928	I	1
7°.0	0.1219	17	0.1228	18	8.1443	1158	0.9925	2	83°.0
1	0.1236	17	0.1246	17	8.0285	1127	0.9923	I	9
2	0.1253	18	0.1263	18	7.9158	1096	0.9921	I	8
3	0.1271	17	0.1281	18	7.8062	1066	0.9919	I	7
4	0.1288	17	0.1299	18	7.6996	1038	0.9917	I	6
5	0.1305	18	0.1317	17	7.5958	1011	0.9914	I	5
6	0.1323	17	0.1334	18	7.4947	985	0.9912	I	4
7	0.1340	17	0.1352	18	7.3962	960	0.9910	I	3
8	0.1357	17	0.1370	18	7.3002	936	0.9907	I	2
9	0.1374	18	0.1388	17	7.2066	912	0.9905	I	1
8°.0	0.1392	17	0.1405	18	7.1154	890	0.9903	3	82°.0
1	0.1409	17	0.1423	18	7.0264	869	0.9900	I	9
2	0.1426	18	0.1441	18	6.9395	847	0.9898	I	8
3	0.1444	17	0.1459	18	6.8548	828	0.9895	I	7
4	0.1461	17	0.1477	18	6.7720	808	0.9893	I	6
5	0.1478	17	0.1495	17	6.6912	790	0.9890	I	5
6	0.1495	18	0.1512	18	6.6122	772	0.9888	I	4
7	0.1513	17	0.1530	18	6.5350	754	0.9885	I	3
8	0.1530	17	0.1548	18	6.4596	737	0.9882	I	2
9	0.1547	17	0.1566	18	6.3859	721	0.9880	I	1
9°.0	0.1564		0.1584		6.3138		0.9877		81°.0
	Cos	d	Cot	d	Tan	d	Sin	d	Angle
	PP								PP

9° to 15°

Angle	Sin	d	Tan	d	Cot	d	Cos	d		P P
9°.0	0.1564	18	0.1584	18	6.3138	706	0.9877	3	81°.0	
1	0.1582	17	0.1602	18	6.2432	690	0.9874	9		
2	0.1599	17	0.1620	18	6.1742	676	0.9871	3		
3	0.1616	17	0.1638	17	6.1066	661	0.9869	2		
4	0.1633	17	0.1655	18	6.0405	647	0.9866	3		
5	0.1650	17	0.1673	18	5.9758	634	0.9863	3		
6	0.1668	18	0.1691	18	5.9124	622	0.9860	3		
7	0.1685	17	0.1709	18	5.8502	608	0.9857	3		
8	0.1702	17	0.1727	18	5.7894	597	0.9854	3		
9	0.1719	17	0.1745	18	5.7297	584	0.9851	3		
10°.0	0.1736	18	0.1763	18	5.6713	573	0.9848	3	80°.0	19
1	0.1754	17	0.1781	18	5.6140	562	0.9845	9		
2	0.1771	17	0.1799	18	5.5578	552	0.9842	3		
3	0.1788	17	0.1817	18	5.5026	542	0.9839	3		
4	0.1805	17	0.1835	18	5.4486	531	0.9836	3		
5	0.1822	17	0.1853	18	5.3955	520	0.9833	3		
6	0.1840	18	0.1871	18	5.3435	511	0.9829	4		
7	0.1857	17	0.1890	18	5.2924	502	0.9826	3		
8	0.1874	17	0.1908	18	5.2422	493	0.9823	3		
9	0.1891	17	0.1926	18	5.1929	483	0.9820	3		
11°.0	0.1908	17	0.1944	18	5.1446	476	0.9816	3	79°.0	
1	0.1925	17	0.1962	18	5.0970	466	0.9813	9		
2	0.1942	17	0.1980	18	5.0504	459	0.9810	3		
3	0.1959	18	0.1998	18	5.0045	451	0.9806	4		
4	0.1977	17	0.2016	19	4.9594	442	0.9803	3		
5	0.1994	17	0.2035	18	4.9152	436	0.9799	4		
6	0.2011	17	0.2053	18	4.8716	428	0.9796	3		
7	0.2028	17	0.2071	18	4.8288	421	0.9792	4		
8	0.2045	17	0.2089	18	4.7867	414	0.9789	3		
9	0.2062	17	0.2107	19	4.7453	407	0.9785	4		
12°.0	0.2079	17	0.2126	18	4.7046	400	0.9781	3	78°.0	18
1	0.2096	17	0.2144	18	4.6646	394	0.9778	9		
2	0.2113	17	0.2162	18	4.6252	388	0.9774	4		
3	0.2130	17	0.2180	19	4.5864	381	0.9770	4		
4	0.2147	17	0.2199	18	4.5483	376	0.9767	3		
5	0.2164	17	0.2217	18	4.5107	370	0.9763	4		
6	0.2181	17	0.2235	19	4.4737	364	0.9759	4		
7	0.2198	17	0.2254	18	4.4373	358	0.9755	3		
8	0.2215	17	0.2272	18	4.4015	353	0.9751	2		
9	0.2233	17	0.2290	19	4.3662	347	0.9748	1		
13°.0	0.2250	17	0.2309	18	4.3315	343	0.9744	4	77°.0	
1	0.2267	17	0.2327	18	4.2972	337	0.9740	9		
2	0.2284	16	0.2345	19	4.2635	332	0.9736	4		
3	0.2300	17	0.2364	18	4.2303	327	0.9732	4		
4	0.2317	17	0.2382	19	4.1976	323	0.9728	6		
5	0.2334	17	0.2401	18	4.1653	318	0.9724	5		
6	0.2351	17	0.2419	19	4.1335	313	0.9720	5		
7	0.2368	17	0.2438	18	4.1022	309	0.9715	3		
8	0.2385	17	0.2456	19	4.0713	305	0.9711	2		
9	0.2402	17	0.2475	18	4.0408	300	0.9707	1		
14°.0	0.2419	17	0.2493	19	4.0108	296	0.9703	4	76°.0	
1	0.2436	17	0.2512	18	3.9812	292	0.9699	9		
2	0.2453	17	0.2530	19	3.9520	288	0.9694	5		
3	0.2470	17	0.2549	19	3.9232	285	0.9690	4		
4	0.2487	17	0.2568	18	3.8947	280	0.9686	6		
5	0.2504	17	0.2586	19	3.8667	276	0.9681	5		
6	0.2521	17	0.2605	19	3.8391	273	0.9677	4		
7	0.2538	16	0.2623	18	3.8118	270	0.9673	3		
8	0.2554	17	0.2642	19	3.7848	265	0.9668	2		
9	0.2571	17	0.2661	18	3.7583	262	0.9664	1		
15°.0	0.2588	17	0.2679	18	3.7321		0.9659		75°.0	
	Cos	d	Cot	d	Tan	d	Sin	d	Angle	P P

15° to 21°

Angle	Sin	d	Tan	d	Cot	d	Cos	d	75°.0	P P
15°.0	0.2588	17	0.2679	19	3.7321	259	0.9659	4	75°.0	
1	0.2605		0.2698		3.7062	256	0.9655	5	9	
2	0.2622	17	0.2717	19	3.6806	252	0.9650	5	8	
3	0.2639	17	0.2736	18	3.6554	249	0.9646	4	7	20
4	0.2656		0.2754		3.6305	246	0.9641	5	6	1 2.0
5	0.2672	16	0.2773	19	3.6059	243	0.9636	5	5	2 4.0
6	0.2689	17	0.2792	19	3.5816	240	0.9632	4	4	3 6.0
7	0.2706	17	0.2811	19	3.5576	237	0.9627	5	3	4 8.0
8	0.2723	17	0.2830	19	3.5339	234	0.9622	5	2	5 10.0
9	0.2740	16	0.2849	18	3.5105	231	0.9617	5	1	6 12.0
16°.0	0.2756	17	0.2867		3.4874		0.9613	4	74°.0	7 14.0
1	0.2773		0.2886		3.4646	228	0.9608	5	9	8 16.0
2	0.2790	17	0.2905	19	3.4420	226	0.9603	5	8	
3	0.2807	17	0.2924	19	3.4197	223	0.9598	5	7	
4	0.2823		0.2943		3.3977	218	0.9593	5	6	
5	0.2840	17	0.2962	19	3.3759	215	0.9588	5	5	19
6	0.2857	17	0.2981	19	3.3544	212	0.9583	5	4	1 1.9
7	0.2874	17	0.3000	19	3.3332	210	0.9578	5	3	2 3.8
8	0.2890	16	0.3019	19	3.3122	208	0.9573	5	2	3 5.7
9	0.2907	17	0.3038	19	3.2914	205	0.9568	5	1	4 7.6
17°.0	0.2924	16	0.3057	19	3.2709	203	0.9563	5	73°.0	5 9.5
1	0.2940		0.3076		3.2506	201	0.9558	5	9	6 11.4
2	0.2957	17	0.3096	20	3.2305	199	0.9553	5	8	7 13.3
3	0.2974	16	0.3115	19	3.2106	196	0.9548	6		8 15.2
4	0.2990		0.3134		3.1910		0.9542	6	6	
5	0.3007	17	0.3153	19	3.1716	194	0.9537	5	5	
6	0.3024	17	0.3172	19	3.1524	192	0.9532	5	4	
7	0.3040	16	0.3191	20	3.1334	190	0.9527	5	3	18
8	0.3057	17	0.3211	19	3.1146	188	0.9521	6	2	1 1.8
9	0.3074	16	0.3230	19	3.0961	185	0.9516	5	1	2 3.6
18°.0	0.3090	17	0.3249	20	3.0777	182	0.9511	6	72°.0	3 5.4
1	0.3107	16	0.3269	19	3.0595	180	0.9505	5	9	4 7.2
2	0.3123		0.3288	19	3.0415	178	0.9500	6	8	5 9.0
3	0.3140	16	0.3307	20	3.0237	176	0.9494	5	7	6 10.8
4	0.3156		0.3327		3.0061		0.9489	6	6	
5	0.3173	17	0.3346	19	2.9887	174	0.9483	6	5	
6	0.3190	16	0.3365	20	2.9714	173	0.9478	5	4	
7	0.3206	17	0.3385	19	2.9544	170	0.9472	6	3	17
8	0.3223	16	0.3404	20	2.9375	169	0.9466	6	2	7 12.6
9	0.3239	17	0.3424	19	2.9208	167	0.9461	5	1	8 14.4
19°.0	0.3256	16	0.3443	20	2.9042	164	0.9455	6	71°.0	9 16.2
1	0.3272	17	0.3463	19	2.8878	162	0.9449	5	9	
2	0.3289	16	0.3482	20	2.8716	160	0.9444	6	8	
3	0.3305	17	0.3502	20	2.8556	159	0.9438	6	7	
4	0.3322	16	0.3522		2.8397		0.9432	6	6	
5	0.3338	16	0.3541	19	2.8239	158	0.9426	6	5	
6	0.3355	16	0.3561	20	2.8083	156	0.9421	5	4	
7	0.3371	16	0.3581	19	2.7929	154	0.9415	6	3	
8	0.3387	17	0.3600	20	2.7776	153	0.9409	6	2	
9	0.3404	16	0.3620	20	2.7625	151	0.9403	6	1	
20°.0	0.3420	17	0.3640	19	2.7475	149	0.9397	6	70°.0	
1	0.3437	16	0.3659	20	2.7326	147	0.9391	6	9	1 1.6
2	0.3453		0.3679	20	2.7179	145	0.9385	6	8	2 3.2
3	0.3469	16	0.3699	20	2.7034	145	0.9379	6	7	3 5.1
4	0.3486	17	0.3719		2.6889		0.9373	6	6	4 6.8
5	0.3502	16	0.3739	20	2.6746	143	0.9367	6	5	5 8.4
6	0.3518	17	0.3759	20	2.6605	141	0.9361	7	4	4 10.4
7	0.3535	16	0.3779	20	2.6464	139	0.9354	6	3	6 9.6
8	0.3551	16	0.3799	20	2.6325	138	0.9348	6	2	7 11.2
9	0.3567	17	0.3819	20	2.6187	136	0.9342	6	1	8 12.8
21°.0	0.3584		0.3839		2.6051		0.9336		69°.0	9 14.4
	Cos	d	Cot	d	Tan	d	Sin	d	Angle	P P

21° to 27°

Angle	sin	d	Tan	d	Cot	d	Cos	d		P P
21°.0	0.3584	16	0.3839	20	2.6051	135	0.9336	6	69°.0	
1	0.3600	16	0.3859	20	2.5916	134	0.9330	9	9	
2	0.3616	16	0.3879	20	2.5782	133	0.9323	8	8	22
3	0.3633	17	0.3899	20	2.5649	133	0.9317	6	7	
4	0.3649	16	0.3919	20	2.5517	132	0.9311	6	6	
5	0.3665	16	0.3939	20	2.5386	131	0.9304	7	5	
6	0.3681	16	0.3959	20	2.5257	129	0.9298	6	4	
7	0.3697	16	0.3979	20	2.5129	128	0.9291	7	3	
8	0.3714	17	0.4000	21	2.5002	127	0.9285	6	2	
9	0.3730	16	0.4020	20	2.4876	126	0.9278	7	1	
22°.0	0.3746	16	0.4040	20	2.4751	125	0.9272	6	68°.0	
1	0.3762	16	0.4061	21	2.4627	124	0.9265	7	9	
2	0.3778	16	0.4081	20	2.4504	123	0.9259	6	8	21
3	0.3795	17	0.4101	20	2.4383	121	0.9252	7	7	
4	0.3811	16	0.4122	21	2.4262	121	0.9245	7	6	
5	0.3827	16	0.4142	20	2.4142	120	0.9239	6	5	
6	0.3843	16	0.4163	21	2.4023	119	0.9232	7	4	
7	0.3859	16	0.4183	20	2.3906	117	0.9225	7	3	
8	0.3875	16	0.4204	21	2.3789	117	0.9219	6	2	
9	0.3891	16	0.4224	20	2.3673	116	0.9212	7	1	
23°.0	0.3907	16	0.4245	21	2.3559	114	0.9205	7	67°.0	
1	0.3923	16	0.4265	20	2.3445	114	0.9198	7	9	
2	0.3939	16	0.4286	21	2.3332	113	0.9191	7	8	20
3	0.3955	16	0.4307	21	2.3220	112	0.9184	7	7	
4	0.3971	16	0.4327	20	2.3109	111	0.9178	6	6	
5	0.3987	16	0.4348	21	2.2998	111	0.9171	7	5	
6	0.4003	16	0.4369	21	2.2889	109	0.9164	7	4	
7	0.4019	16	0.4390	21	2.2781	108	0.9157	7	3	
8	0.4035	16	0.4411	21	2.2673	108	0.9150	7	2	
9	0.4051	16	0.4431	20	2.2566	107	0.9143	8	1	
24°.0	0.4067	16	0.4452	21	2.2460	106	0.9135	7	66°.0	
1	0.4083	16	0.4473	21	2.2355	105	0.9128	7	9	
2	0.4099	16	0.4494	21	2.2251	104	0.9121	7	8	17
3	0.4115	16	0.4515	21	2.2148	103	0.9114	7	7	
4	0.4131	16	0.4536	21	2.2045	103	0.9107	7	6	
5	0.4147	16	0.4557	21	2.1943	102	0.9100	7	5	
6	0.4163	16	0.4578	21	2.1842	101	0.9092	8	4	
7	0.4179	16	0.4599	21	2.1742	100	0.9085	7	3	
8	0.4195	16	0.4621	22	2.1642	100	0.9078	7	2	
9	0.4210	15	0.4642	21	2.1543	99	0.9070	8	1	
25°.0	0.4226	16	0.4663	21	2.1445	98	0.9063	7	65°.0	
1	0.4242	16	0.4684	21	2.1348	97	0.9056	7	9	
2	0.4258	16	0.4706	22	2.1251	97	0.9048	8	8	16
3	0.4274	16	0.4727	21	2.1155	96	0.9041	7	7	
4	0.4289	15	0.4748	21	2.1060	95	0.9033	6	6	
5	0.4305	16	0.4770	22	2.0965	95	0.9026	7	5	
6	0.4321	16	0.4791	21	2.0872	93	0.9018	8	4	
7	0.4337	16	0.4813	22	2.0778	94	0.9011	7	3	
8	0.4352	15	0.4834	21	2.0686	92	0.9003	8	2	
9	0.4368	16	0.4856	22	2.0594	92	0.8996	7	1	
26°.0	0.4384	16	0.4877	21	2.0503	91	0.8988	8	64°.0	
1	0.4399	15	0.4899	22	2.0413	90	0.8980	9	9	
2	0.4415	16	0.4921	22	2.0323	90	0.8973	7	8	15
3	0.4431	16	0.4942	21	2.0233	90	0.8965	8	7	
4	0.4446	15	0.4964	22	2.0145	88	0.8957	8	6	
5	0.4462	16	0.4986	22	2.0057	88	0.8949	8	5	
6	0.4478	16	0.5008	22	1.9970	87	0.8942	7	4	
7	0.4493	15	0.5029	21	1.9883	87	0.8934	8	3	
8	0.4509	16	0.5051	22	1.9797	86	0.8926	8	2	
9	0.4524	15	0.5073	22	1.9711	86	0.8918	8	1	
27°.0	0.4540	16	0.5095	22	1.9626	85	0.8910	8	63°.0	
	Cos	d	Cot	d	Tan	d	Sin	d	Angle	P P

27° to 33°

Angle	Sin	d	Tan	d	Cot	d	Cos	d		P P
27°.0	0.4540	15	0.5095	22	1.9626	84	0.8910	8	63°.0	
1	0.4555	16	0.5117	22	1.9542	84	0.8902	8	9	2.5
2	0.4571	15	0.5139	22	1.9458	84	0.8894	8	8	5.0
3	0.4586	16	0.5161	22	1.9375	83	0.8886	8	7	7.5
4	0.4602	15	0.5184	23	1.9292	83	0.8878	8	6	10.0
5	0.4617	15	0.5206	22	1.9210	82	0.8870	8	5	12.5
6	0.4633	16	0.5228	22	1.9128	82	0.8862	8	4	15.0
7	0.4648	15	0.5250	22	1.9047	80	0.8854	8	3	17.5
8	0.4664	16	0.5272	23	1.8967	80	0.8846	8	2	20.0
9	0.4679	16	0.5295	22	1.8887	80	0.8838	8	1	22.5
28°.0	0.4695	15	0.5317	23	1.8807	79	0.8829	8	62°.0	
1	0.4710	16	0.5340	22	1.8728	78	0.8821	8	9	2.4
2	0.4726	15	0.5362	22	1.8650	78	0.8813	8	8	4.8
3	0.4741	15	0.5384	22	1.8572	78	0.8805	8	7	7.2
4	0.4756	15	0.5407	23	1.8495	77	0.8796	9	6	9.6
5	0.4772	16	0.5430	23	1.8418	77	0.8788	8	5	12.0
6	0.4787	15	0.5452	22	1.8341	77	0.8780	8	4	14.4
7	0.4802	15	0.5475	23	1.8265	76	0.8771	9	3	16.8
8	0.4818	16	0.5498	23	1.8190	75	0.8763	8	2	19.2
9	0.4833	15	0.5520	23	1.8115	75	0.8755	8	1	21.6
29°.0	0.4848	15	0.5543	23	1.8040	74	0.8746	8	61°.0	
1	0.4863	16	0.5566	23	1.7966	74	0.8738	9	9	2.3
2	0.4879	15	0.5589	23	1.7893	73	0.8729	9	8	4.6
3	0.4894	15	0.5612	23	1.7820	73	0.8721	9	7	6.9
4	0.4909	15	0.5635	23	1.7747	73	0.8712	9	6	9.2
5	0.4924	15	0.5658	23	1.7675	72	0.8704	8	5	11.5
6	0.4939	16	0.5681	23	1.7603	72	0.8695	9	4	13.8
7	0.4955	15	0.5704	23	1.7532	71	0.8686	9	3	16.1
8	0.4970	15	0.5727	23	1.7461	71	0.8678	8	2	18.4
9	0.4985	15	0.5750	24	1.7391	70	0.8669	9	1	20.7
30°.0	0.5000	15	0.5774	23	1.7321	70	0.8660	8	60°.0	
1	0.5015	15	0.5797	23	1.7251	69	0.8652	9	9	2.2
2	0.5030	15	0.5820	23	1.7182	69	0.8643	9	8	4.4
3	0.5045	15	0.5844	24	1.7113	68	0.8634	9	7	6.6
4	0.5060	15	0.5867	23	1.7045	68	0.8625	9	6	8.8
5	0.5075	15	0.5890	23	1.6977	68	0.8616	9	5	11.0
6	0.5090	15	0.5914	24	1.6909	67	0.8607	8	4	13.2
7	0.5105	15	0.5938	23	1.6842	67	0.8599	9	3	15.4
8	0.5120	15	0.5961	23	1.6775	66	0.8590	9	2	17.6
9	0.5135	15	0.5985	24	1.6709	66	0.8581	9	1	19.8
31°.0	0.5150	15	0.6009	23	1.6643	66	0.8572	9	59°.0	
1	0.5165	15	0.6032	24	1.6577	65	0.8563	9	9	2.2
2	0.5180	15	0.6056	24	1.6512	65	0.8554	9	8	4.4
3	0.5195	15	0.6080	24	1.6447	64	0.8545	9	7	6.6
4	0.5210	15	0.6104	24	1.6383	64	0.8536	9	6	8.8
5	0.5225	15	0.6128	24	1.6319	64	0.8526	10	5	11.0
6	0.5240	15	0.6152	24	1.6255	64	0.8517	9	4	13.2
7	0.5255	15	0.6176	24	1.6191	63	0.8508	9	3	15.4
8	0.5270	14	0.6200	24	1.6128	62	0.8499	9	2	17.6
9	0.5284	15	0.6224	25	1.6066	63	0.8490	9	1	19.8
32°.0	0.5299	15	0.6249	24	1.6003	62	0.8480	9	58°.0	
1	0.5314	15	0.6273	24	1.5941	61	0.8471	9	9	2.2
2	0.5329	15	0.6297	25	1.5880	62	0.8462	9	8	4.4
3	0.5344	14	0.6322	24	1.5818	61	0.8453	10	7	6.6
4	0.5358	15	0.6346	25	1.5757	60	0.8443	9	6	8.8
5	0.5373	15	0.6371	24	1.5697	60	0.8434	9	5	11.0
6	0.5388	14	0.6395	25	1.5637	60	0.8425	10	4	13.2
7	0.5402	15	0.6420	25	1.5577	60	0.8415	9	3	15.4
8	0.5417	15	0.6445	24	1.5517	59	0.8406	9	2	17.6
9	0.5432	14	0.6460	25	1.5458	59	0.8396	10	1	19.8
33°.0	0.5446	—	0.6494	—	1.5399	—	0.8387	9	57°.0	
	Cos	d	Cot	d	Tan	d	Sin	d	Angle	P P

33° to 39°

Angle	sin	d	Tan	d	Cot	d	Cos	d		P P
33°.0	0.5446	15	0.6494	25	1.5399	59	0.8387	10	57°.0	
1	0.5461	15	0.6519	25	1.5340	58	0.8377	9	9	29
2	0.5476	15	0.6544	25	1.5282	58	0.8368	9	8	2.9
3	0.5490	14	0.6569	25	1.5224	58	0.8358	10	7	5.8
4	0.5505	14	0.6594	25	1.5166	58	0.8348	9	6	8.7
5	0.5519	14	0.6619	25	1.5108	58	0.8339	10	5	11.6
6	0.5534	15	0.6644	25	1.5051	57	0.8329	9	4	14.5
7	0.5548	14	0.6669	25	1.4994	56	0.8320	10	3	17.4
8	0.5563	15	0.6694	26	1.4938	56	0.8310	10	2	20.3
9	0.5577	14	0.6720	25	1.4882	56	0.8300	10	1	23.2
34°.0	0.5592	14	0.6745	26	1.4826	56	0.8290	9	56°.0	28
1	0.5606	14	0.6771	26	1.4770	55	0.8281	10	9	2.8
2	0.5621	15	0.6796	25	1.4715	55	0.8271	10	8	5.6
3	0.5635	14	0.6822	26	1.4659	56	0.8261	10	7	8.4
4	0.5650	15	0.6847	25	1.4605	54	0.8251	10	6	11.2
5	0.5664	14	0.6873	26	1.4550	55	0.8241	10	5	14.0
6	0.5678	14	0.6899	26	1.4496	54	0.8231	10	4	16.8
7	0.5693	15	0.6924	25	1.4442	54	0.8221	10	3	19.6
8	0.5707	14	0.6950	26	1.4388	54	0.8211	9	2	22.4
9	0.5721	14	0.6976	26	1.4335	54	0.8202	10	1	25.2
35°.0	0.5736	14	0.7002	26	1.4281	52	0.8192	11	55°.0	
1	0.5750	14	0.7028	26	1.4229	53	0.8181	10	9	
2	0.5764	14	0.7054	26	1.4176	53	0.8171	10	8	4.4
3	0.5779	15	0.7080	26	1.4124	52	0.8161	10	7	10.8
4	0.5793	14	0.7107	26	1.4071	53	0.8151	10	6	13.5
5	0.5807	14	0.7133	26	1.4019	52	0.8141	10	5	16.2
6	0.5821	14	0.7159	27	1.3968	51	0.8131	10	4	18.9
7	0.5835	14	0.7186	26	1.3916	52	0.8121	10	3	21.6
8	0.5850	15	0.7212	27	1.3865	51	0.8111	11	2	2.6
9	0.5864	14	0.7239	26	1.3814	51	0.8100	10	1	5.2
36°.0	0.5878	14	0.7265	27	1.3764	51	0.8090	10	54°.0	
1	0.5892	14	0.7292	27	1.3713	50	0.8080	10	9	
2	0.5906	14	0.7319	27	1.3663	50	0.8070	11	8	
3	0.5920	14	0.7346	27	1.3613	49	0.8059	10	7	4.4
4	0.5934	14	0.7373	27	1.3564	50	0.8049	10	6	13.5
5	0.5948	14	0.7400	27	1.3514	50	0.8039	11	5	16.2
6	0.5962	14	0.7427	27	1.3465	49	0.8028	10	4	18.9
7	0.5976	14	0.7454	27	1.3416	49	0.8018	11	3	21.6
8	0.5990	14	0.7481	27	1.3367	49	0.8007	10	2	2.6
9	0.6004	14	0.7508	28	1.3319	48	0.7997	11	1	5.2
37°.0	0.6018	14	0.7536	27	1.3270	48	0.7986	10	52°.0	
1	0.6032	14	0.7563	27	1.3222	47	0.7976	11	9	
2	0.6046	14	0.7590	28	1.3175	48	0.7965	10	8	
3	0.6060	14	0.7618	28	1.3127	48	0.7955	11	7	13.5
4	0.6074	14	0.7646	27	1.3079	47	0.7944	10	6	1.4
5	0.6088	14	0.7673	28	1.3032	47	0.7934	11	5	2.8
6	0.6101	13	0.7701	28	1.2985	47	0.7923	11	4	4.2
7	0.6115	14	0.7729	28	1.2938	46	0.7912	10	3	5.6
8	0.6129	14	0.7757	28	1.2892	46	0.7902	11	2	7.0
9	0.6143	14	0.7785	28	1.2846	47	0.7891	11	1	8.4
38°.0	0.6157	13	0.7813	28	1.2799	46	0.7880	11	52°.0	
1	0.6170	14	0.7841	28	1.2753	45	0.7869	10	9	
2	0.6184	14	0.7869	29	1.2708	46	0.7859	11	8	
3	0.6198	13	0.7898	28	1.2662	45	0.7848	11	7	1.3
4	0.6211	14	0.7926	28	1.2617	45	0.7837	11	6	2.6
5	0.6225	14	0.7954	29	1.2572	45	0.7826	11	5	3.9
6	0.6239	13	0.7983	29	1.2527	45	0.7815	11	4	5.2
7	0.6252	14	0.8012	28	1.2482	45	0.7804	11	3	6.5
8	0.6266	14	0.8040	29	1.2437	45	0.7793	11	2	7.8
9	0.6280	13	0.8069	29	1.2393	44	0.7782	11	1	9.1
39°.0	0.6293	13	0.8098	29	1.2349	44	0.7771	11	51°.0	
	Cos	d	Cot	d	Tan	d	Sin	d	Angle	P P

51° to 57°

(S3)

39° to 45°

Angle	Sin	d	Tan	d	Cot	d	Cos	d	51°.0	P P
39°.0	0.6293	I 4	0.8098	29	1.2349	44	0.7771	II	9	34
1	0.6307	I 4	0.8127	29	1.2305	44	0.7760	II	8	I 3.4
2	0.6320	I 3	0.8156	29	1.2261	44	0.7749	II	7	2 6.8
3	0.6334	I 4	0.8185	29	1.2218	43	0.7738	II		3 10.2
4	0.6347	I 4	0.8214		1.2174	44	0.7727	II	6	4 13.6
5	0.6361	I 4	0.8243	30	1.2131	43	0.7716	II	5	5 17.0
6	0.6374	I 3	0.8273	30	1.2088	43	0.7705	II	4	6 20.4
7	0.6388	I 4	0.8302	30	1.2045	43	0.7694	II	3	7 23.8
8	0.6401	I 3	0.8332	30	1.2002	43	0.7683	II	2	8 27.2
9	0.6414	I 3	0.8361	29	1.1960	42	0.7672	II	1	9 30.6
40°.0	0.6428	I 3	0.8391	30	1.1918	42	0.7660	II	50°.0	33
1	0.6441	I 4	0.8421	30	1.1875	43	0.7649	II	9	I 3.3
2	0.6455	I 4	0.8451	30	1.1833	42	0.7638	II	8	2 6.6
3	0.6468	I 3	0.8481	30	1.1792	41	0.7627	II	7	3 9.9
4	0.6481	I 3	0.8511		1.1750	42	0.7615	II	6	4 13.2
5	0.6494	I 3	0.8541	30	1.1708	42	0.7604	II	5	5 16.5
6	0.6508	I 4	0.8571	30	1.1667	41	0.7593	II	4	6 19.8
7	0.6521	I 3	0.8601	30	1.1626	41	0.7581	II	3	7 23.1
8	0.6534	I 3	0.8632	31	1.1585	41	0.7570	II	2	8 26.4
9	0.6547	I 3	0.8662	30	1.1544	40	0.7559	II	1	9 29.7
41°.0	0.6561	I 3	0.8693	31	1.1504	41	0.7547	II	49°.0	I 3.2
1	0.6574	I 3	0.8724	30	1.1463	40	0.7536	II	9	2 6.4
2	0.6587	I 3	0.8754	30	1.1423	40	0.7524	II	8	3 9.6
3	0.6600	I 3	0.8785	31	1.1383	40	0.7513	II	7	4 12.8
4	0.6613	I 3	0.8816		1.1343	40	0.7501	II	6	5 16.0
5	0.6626	I 3	0.8847	31	1.1303	40	0.7490	II	5	6 19.2
6	0.6639	I 3	0.8878	31	1.1263	39	0.7478	II	4	7 22.4
7	0.6652	I 3	0.8910	32	1.1224	39	0.7466	II	3	8 25.6
8	0.6665	I 3	0.8941	31	1.1184	40	0.7455	II	2	9 28.8
9	0.6678	I 3	0.8972	31	1.1145	39	0.7443	II	1	
42°.0	0.6691	I 3	0.9004	32	1.1106	39	0.7431	II	48°.0	I 3.1
1	0.6704	I 3	0.9036	32	1.1067	39	0.7420	II	9	2 6.2
2	0.6717	I 3	0.9067	31	1.1028	38	0.7408	II	8	3 9.3
3	0.6730	I 3	0.9099	32	1.0990	39	0.7396	II	7	4 12.4
4	0.6743	I 3	0.9131	32	1.0951	38	0.7385	II	6	5 15.5
5	0.6756	I 3	0.9163	32	1.0913	38	0.7373	II	5	6 18.6
6	0.6769	I 3	0.9195	32	1.0875	38	0.7361	II	4	7 21.7
7	0.6782	I 2	0.9228	33	1.0837	38	0.7349	II	3	8 24.8
8	0.6794	I 2	0.9260	32	1.0799	38	0.7337	II	2	9 27.9
9	0.6807	I 3	0.9293	33	1.0761	37	0.7325	II	1	
43°.0	0.6820	I 3	0.9325	33	1.0724	38	0.7314	II	47°.0	I 2.9
1	0.6833	I 2	0.9358	33	1.0686	37	0.7302	II	9	2 5.8
2	0.6845	I 2	0.9391	33	1.0649	37	0.7290	II	8	3 8.7
3	0.6858	I 3	0.9424	33	1.0612	37	0.7278	II	7	4 11.6
4	0.6871	I 3	0.9457		1.0575	37	0.7266	II	6	5 14.5
5	0.6884	I 3	0.9490	33	1.0538	37	0.7254	II	5	6 17.4
6	0.6896	I 3	0.9523	33	1.0501	37	0.7242	II	4	7 20.3
7	0.6909	I 2	0.9556	33	1.0464	36	0.7230	II	3	8 23.2
8	0.6921	I 2	0.9590	34	1.0428	36	0.7218	II	2	9 26.1
9	0.6934	I 3	0.9623	33	1.0392	37	0.7206	II	1	
44°.0	0.6947	I 2	0.9657	34	1.0355	36	0.7193	II	46°.0	I 2.8
1	0.6959	I 3	0.9691		1.0319	36	0.7181	II	9	2 5.6
2	0.6972	I 2	0.9725	34	1.0283	36	0.7169	II	8	3 8.4
3	0.6984	I 3	0.9759	34	1.0247	35	0.7157	II	7	4 11.2
4	0.6997	I 2	0.9793		1.0212	36	0.7145	II	6	5 14.2
5	0.7009	I 2	0.9827	34	1.0176	36	0.7133	II	5	6 17.0
6	0.7022	I 2	0.9861	34	1.0141	35	0.7120	II	4	7 20.4
7	0.7034	I 2	0.9896	34	1.0105	35	0.7108	II	3	8 23.8
8	0.7046	I 3	0.9930	35	1.0070	35	0.7096	II	2	9 27.2
9	0.7059	I 2	0.9965	35	1.0035	35	0.7083	II	1	11.7
45°.0	0.7071		1.0000		1.0000		0.7071		45°.0	
	Cos	d	Cot	d	Tan	d	Sin	d	Angle	P P

TABLE VI
FOUR-PLACE VALUES
OF THE
SQUARES OF NUMBERS
FROM 0.000 TO 3.500

Squares of Numbers from 0.000 to 0.500

N	N ² 0	1	2	3	4	5	6	7	8	9	P P
0.00	0.0000	0000	0000	0000	0000	0000	0000	0000	0001	0001	
01	0001	0001	0001	0002	0002	0002	0003	0003	0003	0004	2 3
02	0004	0004	0005	0005	0006	0006	0007	0007	0008	0008	1 0.2 0.3
03	0009	0010	0010	0011	0012	0012	0013	0014	0014	0015	2 0.4 0.6
04	0016	0017	0018	0018	0019	0020	0021	0022	0023	0024	3 0.6 0.9
05	0.0025	0026	0027	0028	0029	0030	0031	0032	0034	0035	4 0.8 1.2
06	0036	0037	0038	0040	0041	0042	0044	0045	0046	0048	5 1.0 1.5
07	0049	0050	0052	0053	0055	0056	0058	0059	0061	0062	6 1.2 1.8
08	0064	0066	0067	0069	0071	0072	0074	0076	0077	0079	7 1.4 2.1
09	0081	0083	0085	0086	0088	0090	0092	0094	0096	0098	8 1.6 2.4
0.10	0.0100	0102	0104	0106	0108	0110	0112	0114	0117	0119	9 1.8 2.7
11	0121	0123	0125	0128	0130	0132	0135	0137	0139	0142	
12	0144	0146	0149	0151	0154	0156	0159	0161	0164	0166	1 0.4 0.5
13	0169	0172	0174	0177	0180	0182	0185	0188	0190	0193	2 0.8 1.0
14	0196	0199	0202	0204	0207	0210	0213	0216	0219	0222	3 1.2 1.5
15	0.0225	0228	0231	0234	0237	0240	0243	0246	0250	0253	4 1.6 2.0
16	0256	0259	0262	0266	0269	0272	0276	0279	0282	0286	5 2.0 2.5
17	0289	0292	0296	0299	0303	0306	0310	0313	0317	0320	6 2.4 3.0
18	0324	0328	0331	0335	0339	0342	0346	0350	0353	0357	7 2.8 3.5
19	0361	0365	0369	0372	0376	0380	0384	0388	0392	0396	8 3.2 4.0
0.20	0.0400	0404	0408	0412	0416	0420	0424	0428	0433	0437	9 3.6 4.5
21	0441	0445	0449	0454	0458	0462	0467	0471	0475	0480	
22	0484	0488	0493	0497	0502	0506	0511	0515	0520	0524	1 0.6 0.7
23	0529	0534	0538	0543	0548	0552	0557	0562	0566	0571	2 1.2 1.4
24	0576	0581	0586	0590	0595	0600	0605	0610	0615	0620	3 1.8 2.1
25	0.0625	0630	0635	0640	0645	0650	0655	0660	0666	0671	4 2.4 2.8
26	0676	0681	0686	0692	0697	0702	0708	0713	0718	0724	5 3.0 3.5
27	0729	0734	0740	0745	0751	0756	0762	0767	0773	0778	6 3.6 4.2
28	0784	0790	0795	0801	0807	0812	0818	0824	0829	0835	7 4.2 4.9
29	0841	0847	0853	0858	0864	0870	0876	0882	0888	0894	8 4.8 5.6
0.30	0.0900	0906	0912	0918	0924	0930	0936	0942	0949	0955	9 5.4 6.3
31	0961	0967	0973	0980	0986	0992	0999	1005	1011	1018	
32	1024	1030	1037	1043	1050	1056	1063	1069	1076	1082	1 0.8 0.9
33	1089	1096	1102	1109	1116	1122	1129	1136	1142	1149	2 1.6 1.8
34	1156	1163	1170	1176	1183	1190	1197	1204	1211	1218	3 2.4 2.7
35	0.1225	1232	1239	1246	1253	1260	1267	1274	1282	1289	4 3.2 3.6
36	1296	1303	1310	1318	1325	1332	1340	1347	1354	1362	5 4.0 4.5
37	1369	1376	1384	1391	1399	1406	1414	1421	1429	1436	6 4.8 5.4
38	1444	1452	1459	1467	1475	1482	1490	1498	1505	1513	7 5.6 6.3
39	1521	1529	1537	1544	1552	1560	1568	1576	1584	1592	8 6.4 7.2
0.40	0.1600	1608	1616	1624	1632	1640	1648	1656	1665	1673	9 7.2 8.1
41	1681	1689	1697	1706	1714	1722	1731	1739	1747	1756	
42	1764	1772	1781	1789	1798	1806	1815	1823	1832	1840	1 1.0 1.1
43	1849	1858	1866	1875	1884	1892	1901	1910	1918	1927	2 2.0 2.2
44	1936	1945	1954	1962	1971	1980	1989	1998	2007	2016	3 3.0 3.3
45	0.2025	2034	2043	2052	2061	2070	2079	2088	2098	2107	4 4.0 4.4
46	2116	2125	2134	2144	2153	2162	2172	2181	2190	2200	5 5.0 5.5
47	2209	2218	2228	2237	2247	2256	2266	2275	2285	2294	6 6.0 6.6
48	2304	2314	2323	2333	2343	2352	2362	2372	2381	2391	7 7.0 7.7
49	2401	2411	2421	2430	2440	2450	2460	2470	2480	2490	8 8.0 8.8
0.50	0.2500	2510	2520	2530	2540	2550	2560	2570	2581	2591	9 9.0 9.9
N	N ² 0	1	2	3	4	5	6	7	8	9	P P

Moving the decimal point *one* place in N is equivalent to moving it *two* places in N².

Squares of Numbers from 0.500 to 1.000

N	N ²	0	1	2	3	4	5	6	7	8	9	P	P
0.50	0.2500	2510	2520	2530	2540	2550	2560	2570	2580	2590		10	11
51	2601	2611	2621	2632	2642	2652	2663	2673	2683	2694	I	1.0	1.1
52	2704	2714	2725	2735	2746	2756	2767	2777	2788	2798	2	2.0	2.2
53	2809	2820	2830	2841	2852	2862	2873	2884	2894	2905	3	3.0	3.3
54	2916	2927	2938	2948	2959	2970	2981	2992	3003	3014	4	4.0	4.4
55	0.3025	3036	3047	3058	3069	3080	3091	3102	3114	3125	6	6.0	6.6
56	3136	3147	3158	3170	3181	3192	3204	3215	3226	3238	7	7.0	7.7
57	3249	3260	3272	3283	3295	3306	3318	3329	3341	3352	8	8.0	8.8
58	3364	3376	3387	3399	3411	3422	3434	3446	3457	3469	9	9.0	9.9
59	3481	3493	3505	3516	3528	3540	3552	3564	3576	3588		12	13
0.60	0.3600	3612	3624	3636	3648	3660	3672	3684	3697	3709	I	1.2	1.3
61	3721	3733	3745	3758	3770	3782	3795	3807	3819	3832	2	2.4	2.6
62	3844	3856	3869	3881	3894	3906	3919	3931	3944	3956	3	3.6	3.9
63	3969	3982	3994	4007	4020	4032	4045	4058	4070	4083	4	4.8	5.2
64	4096	4109	4122	4134	4147	4160	4173	4186	4199	4212	5	6.0	6.5
65	0.4225	4238	4251	4264	4277	4290	4303	4316	4330	4343	6	7.2	7.8
66	4356	4369	4382	4396	4409	4422	4436	4449	4462	4476	7	8.4	9.1
67	4489	4502	4516	4529	4543	4556	4570	4583	4597	4610	8	9.6	10.4
68	4624	4638	4651	4665	4679	4692	4706	4720	4733	4747	9	10.8	11.7
69	4761	4775	4789	4802	4816	4830	4844	4858	4872	4886		14	15
0.70	0.4900	4914	4928	4942	4956	4970	4984	4998	5013	5027	4	5.6	6.0
71	5041	5055	5069	5084	5098	5112	5127	5141	5155	5170	5	7.0	7.5
72	5184	5198	5213	5227	5242	5256	5271	5285	5300	5314	6	8.4	9.0
73	5329	5344	5358	5373	5388	5402	5417	5432	5446	5461	7	9.8	10.5
74	5476	5491	5506	5520	5535	5550	5565	5580	5595	5610	8	11.2	12.0
75	0.5625	5640	5655	5670	5685	5700	5715	5730	5746	5761	9	12.6	13.5
76	5776	5791	5806	5822	5837	5852	5868	5883	5898	5914		16	17
77	5929	5944	5960	5975	5991	6006	6022	6037	6053	6068	I	1.6	1.7
78	6084	6100	6115	6131	6147	6162	6178	6194	6209	6225	2	3.2	3.4
79	6241	6257	6273	6288	6304	6320	6336	6352	6368	6384	3	4.8	5.1
0.80	0.6400	6416	6432	6448	6464	6480	6496	6512	6529	6545	4	6.4	6.8
81	6561	6577	6593	6610	6626	6642	6659	6675	6691	6708	5	9.6	10.2
82	6724	6740	6757	6773	6790	6806	6823	6839	6856	6872	6	11.2	11.9
83	6889	6906	6922	6939	6956	6972	6989	7006	7022	7039	7	12.8	13.6
84	7056	7073	7090	7106	7123	7140	7157	7174	7191	7208	8	14.4	15.3
85	0.7225	7242	7259	7276	7293	7310	7327	7344	7362	7379	I	1.8	1.0
86	7396	7413	7430	7448	7465	7482	7500	7517	7534	7552	2	3.6	3.8
87	7569	7586	7604	7621	7639	7656	7674	7691	7709	7726	3	5.4	5.7
88	7744	7762	7779	7797	7815	7832	7850	7868	7885	7903	4	7.2	7.6
89	7921	7939	7957	7974	7992	8010	8028	8046	8064	8082	5	9.0	9.5
0.90	0.8100	8118	8136	8154	8172	8190	8208	8226	8245	8263	6	10.8	11.4
91	8281	8299	8317	8336	8354	8372	8391	8409	8427	8446	7	12.6	13.3
92	8464	8482	8501	8519	8538	8556	8575	8593	8612	8630	8	14.4	15.2
93	8649	8668	8686	8705	8724	8742	8761	8780	8798	8817	9	16.2	17.1
94	8836	8855	8874	8892	8911	8930	8949	8968	8987	9006	I	2.0	2.1
95	0.9025	9044	9063	9082	9101	9120	9139	9158	9178	9197	2	4.0	4.2
96	9216	9235	9254	9274	9293	9312	9332	9351	9370	9390	3	6.0	6.3
97	9409	9428	9448	9467	9487	9506	9526	9545	9565	9584	4	8.0	8.4
98	9604	9624	9643	9663	9683	9702	9722	9742	9761	9781	5	10.0	10.5
99	0.9801	9821	9841	9860	9880	9900	9920	9940	9960	9980	6	12.0	12.6
1.00	1.0000	0020	0040	0060	0080	0100	0120	0140	0161	0181	7	14.0	14.7
N	N ²	0	1	2	3	4	5	6	7	8	9	P	P

Moving the decimal point *one* place in N is equivalent to moving it *two* places in N².

Squares of Numbers from 1.000 to 1.500

N	N^2	0	1	2	3	4	5	6	7	8	9	P	P	
1.00	1.0000	0020	0040	0060	0080	0100	0120	0140	0160	0180		20	21	
01	0201	0221	0241	0262	0282	0302	0323	0343	0363	0384		1	2.0	2.1
02	0404	0424	0445	0465	0486	0506	0527	0547	0568	0588		2	4.0	4.2
03	0609	0630	0650	0671	0692	0712	0733	0754	0774	0795		3	6.0	6.3
04	0816	0837	0858	0878	0899	0920	0941	0962	0983	1004		4	8.0	8.4
05	1.1025	1046	1067	1088	1109	1130	1151	1172	1194	1215		5	10.0	10.5
06	1236	1257	1278	1300	1321	1342	1364	1385	1406	1428		6	12.0	12.6
07	1449	1470	1492	1513	1535	1556	1578	1599	1621	1642		7	14.0	14.7
08	1664	1686	1707	1729	1751	1772	1794	1816	1837	1859		8	16.0	16.8
09	1881	1903	1925	1946	1968	1990	2012	2034	2056	2078		9	18.0	18.9
1.10	1.2100	2122	2144	2166	2188	2210	2232	2254	2277	2299		1	2.2	2.3
11	2321	2343	2365	2388	2410	2432	2455	2477	2499	2522		2	4.4	4.6
12	2544	2566	2589	2611	2634	2656	2679	2701	2724	2746		3	6.6	6.9
13	2769	2792	2814	2837	2860	2882	2905	2928	2950	2973		4	8.8	9.2
14	2996	3019	3042	3064	3087	3110	3133	3156	3179	3202		5	11.0	11.5
15	1.3225	3248	3271	3294	3317	3340	3363	3386	3410	3433		6	13.2	13.8
16	3456	3479	3502	3526	3549	3572	3596	3619	3642	3666		7	15.4	16.1
17	3680	3712	3736	3759	3783	3806	3830	3853	3877	3900		8	17.6	18.4
18	3924	3948	3971	3995	4019	4042	4066	4090	4113	4137		9	19.8	20.7
19	4161	4185	4209	4232	4256	4280	4304	4328	4352	4376		1	2.4	2.5
1.20	1.4400	4424	4448	4472	4496	4520	4544	4568	4593	4617		2	4.8	5.0
21	4641	4665	4689	4714	4738	4762	4787	4811	4835	4860		3	7.2	7.5
22	4884	4908	4933	4957	4982	5006	5031	5055	5080	5104		4	9.6	10.0
23	5129	5154	5178	5203	5228	5252	5277	5302	5326	5351		5	12.0	12.5
24	5376	5401	5426	5450	5475	5500	5525	5550	5575	5600		6	14.4	15.0
25	1.5625	5650	5675	5700	5725	5750	5775	5800	5826	5851		7	16.8	17.5
26	5876	5901	5926	5952	5977	6002	6028	6053	6078	6104		8	19.2	20.0
27	6129	6154	6180	6205	6231	6256	6282	6307	6333	6358		1	2.6	2.7
28	6384	6410	6435	6461	6487	6512	6538	6564	6589	6615		2	5.2	5.4
29	6641	6667	6693	6718	6744	6770	6796	6822	6848	6874		3	7.8	8.1
1.30	1.6900	6926	6952	6978	7004	7030	7056	7082	7109	7135		4	10.4	10.8
31	7161	7187	7213	7240	7266	7292	7319	7345	7371	7398		5	13.0	13.5
32	7424	7450	7477	7503	7530	7556	7583	7609	7636	7662		6	15.6	16.2
33	7689	7716	7742	7769	7796	7822	7849	7876	7902	7929		7	18.2	18.9
34	7956	7983	8010	8036	8063	8090	8117	8144	8171	8198		8	20.8	21.6
35	1.8225	8252	8279	8306	8333	8360	8387	8414	8442	8469		9	23.4	24.3
36	8496	8523	8550	8578	8605	8632	8660	8687	8714	8742		1	5.6	5.8
37	8769	8796	8824	8851	8879	8906	8934	8961	8989	9016		2	8.4	8.7
38	9044	9072	9099	9127	9155	9182	9210	9238	9265	9293		3	10.4	10.8
39	9321	9349	9377	9404	9432	9460	9488	9516	9544	9572		4	12.8	13.4
1.40	1.9600	9628	9656	9684	9712	9740	9768	9796	9825	9853		5	15.0	15.5
41	1.9881	9909	9937	9966	9994	0022	0051	0079	0107	0136		6	18.0	18.6
42	2.0164	0192	0221	0249	0278	0306	0335	0363	0392	0420		7	21.0	21.7
43	0449	0478	0506	0535	0564	0592	0621	0650	0678	0707		8	24.0	24.8
44	0736	0765	0794	0822	0851	0880	0909	0938	0967	0996		9	27.0	27.9
45	2.1025	1054	1083	1112	1141	1170	1199	1228	1258	1287		1	3.0	3.1
46	1316	1345	1374	1404	1433	1462	1492	1521	1550	1580		2	6.0	6.2
47	1609	1638	1668	1697	1727	1756	1786	1815	1845	1874		3	9.0	9.3
48	1904	1934	1963	1993	2023	2052	2082	2112	2141	2171		4	12.0	12.4
49	2201	2231	2261	2290	2320	2350	2380	2410	2440	2470		5	15.0	15.5
1.50	2.2500	2530	2560	2590	2620	2650	2680	2710	2741	2771		6	18.0	18.6
N	N^2	0	1	2	3	4	5	6	7	8	9	P	P	

Moving the decimal point *one* place in N is equivalent to moving it *two* places in N^2 .

Squares of Numbers from 1.500 to 2.000

N	N ² 0	1	2	3	4	5	6	7	8	9	P P
1.50	2.2500	2530	2560	2590	2620	2650	2680	2710	2741	2771	30 31
51	2801	2831	2861	2892	2922	2952	2983	3013	3043	3074	3.0 3.1
52	3104	3134	3165	3195	3226	3256	3287	3317	3348	3378	6.0 6.2
53	3409	3440	3470	3501	3532	3562	3593	3624	3654	3685	9.0 9.3
54	3716	3747	3778	3808	3839	3870	3901	3932	3963	3994	12.0 12.4
55	2.4025	4056	4087	4118	4149	4180	4211	4242	4274	4305	15.0 15.5
56	4336	4367	4398	4430	4461	4492	4524	4555	4586	4618	18.0 18.6
57	4649	4680	4712	4743	4775	4806	4838	4869	4901	4932	21.0 21.7
58	4904	4996	5027	5059	5091	5122	5154	5186	5217	5249	24.0 24.8
59	5281	5313	5345	5376	5408	5440	5472	5504	5536	5568	27.0 27.9
1.60	2.5600	5632	5664	5696	5728	5760	5792	5824	5857	5889	32 33
61	5921	5953	5985	6018	6050	6082	6115	6147	6179	6212	3.2 3.3
62	6244	6276	6309	6341	6374	6406	6439	6471	6504	6536	6.4 6.6
63	6569	6602	6634	6667	6700	6732	6765	6798	6830	6863	9.6 9.9
64	6896	6929	6962	6994	7027	7060	7093	7126	7159	7192	12.8 13.2
65	2.7225	7258	7291	7324	7357	7390	7423	7456	7490	7523	16.0 16.5
66	7556	7589	7622	7656	7689	7722	7756	7789	7822	7856	19.2 19.8
67	7889	7922	7956	7989	8023	8056	8090	8123	8157	8190	22.4 23.1
68	8224	8258	8291	8325	8359	8392	8426	8460	8493	8527	25.6 26.4
69	8561	8595	8629	8662	8696	8730	8764	8798	8832	8866	28.8 29.7
1.70	2.8900	8934	8968	9002	9036	9070	9104	9138	9173	9207	34 35
71	9241	9275	9309	9344	9378	9412	9447	9481	9515	9550	10.2 10.5
72	9584	9618	9653	9687	9722	9756	9791	9825	9860	9894	13.6 14.0
73	2.9929	9964	9998	0033	0068	0102	0137	0172	0206	0241	17.0 17.5
74	3.0276	0311	0346	0380	0415	0450	0485	0520	0555	0590	20.4 21.0
75	3.0625	0660	0695	0730	0765	0800	0835	0870	0906	0941	23.8 24.5
76	0976	1011	1046	1082	1117	1152	1188	1223	1258	1294	27.2 28.0
77	1329	1364	1400	1435	1471	1506	1542	1577	1613	1648	30.6 31.5
78	1684	1720	1755	1791	1827	1862	1898	1934	1969	2005	34.4 35.2
79	2041	2077	2113	2148	2184	2220	2256	2292	2328	2364	37.6 38.4
1.80	3.2400	2436	2472	2508	2544	2580	2616	2652	2689	2725	38 39
81	2761	2797	2833	2870	2906	2942	2979	3015	3051	3088	21.6 22.2
82	3124	3160	3197	3233	3270	3306	3343	3379	3416	3452	25.2 25.9
83	3489	3526	3562	3599	3636	3672	3709	3746	3782	3819	28.8 29.6
84	3856	3893	3930	3966	4003	4040	4077	4114	4151	4188	32.4 33.3
85	3.4225	4262	4299	4336	4373	4410	4447	4484	4522	4559	36.0 37.0
86	4596	4633	4670	4708	4745	4782	4820	4857	4894	4932	38.8 39.6
87	4969	5006	5044	5081	5119	5156	5194	5231	5266	5306	42.4 43.2
88	5344	5382	5419	5457	5495	5532	5570	5608	5645	5683	45.2 46.0
89	5721	5759	5797	5834	5872	5910	5948	5986	6024	6062	48.0 48.8
1.90	3.6100	6138	6176	6214	6252	6290	6328	6366	6405	6443	51.6 52.4
91	6481	6519	6557	6596	6634	6672	6711	6749	6787	6826	55.2 56.0
92	6864	6902	6941	6979	7018	7056	7095	7133	7172	7210	58.0 58.8
93	7249	7288	7326	7365	7404	7442	7481	7520	7558	7597	61.4 62.2
94	7636	7675	7714	7752	7791	7830	7869	7908	7947	7986	64.2 65.0
95	3.8025	8064	8103	8142	8181	8220	8259	8298	8338	8377	67.0 67.8
96	8416	8455	8494	8534	8573	8612	8652	8691	8730	8770	70.0 70.8
97	8809	8848	8888	8927	8967	9006	9046	9085	9125	9164	73.0 73.8
98	9204	9244	9283	9323	9363	9402	9442	9482	9521	9561	76.0 76.8
99	9601	9641	9681	9720	9760	9800	9840	9880	9920	9960	80.0 80.8
2.00	4.0000	0040	0080	0120	0160	0200	0240	0280	0321	0361	83.0 83.8
N	N ² 0	1	2	3	4	5	6	7	8	9	P P

Moving the decimal point *one* place in N is equivalent to moving it *two* places in N².

Squares of Numbers from 2.000 to 2.500

N	N ² 0	1	2	3	4	5	6	7	8	9	P P
2.00	4.0000	0040	0080	0120	0160	0200	0240	0280	0321	0361	40 41
01	0401	0441	0481	0522	0562	0602	0643	0683	0723	0764	1 4.0 4.1
02	0804	0844	0885	0925	0966	1006	1047	1087	1128	1168	2 8.0 8.2
03	1209	1250	1290	1331	1372	1412	1453	1494	1534	1575	3 12.0 12.3
04	1616	1657	1698	1738	1779	1820	1861	1902	1943	1984	4 16.0 16.4
05	4.2025	2066	2107	2148	2189	2230	2271	2312	2354	2395	5 20.0 20.5
06	2436	2477	2518	2560	2601	2642	2684	2725	2766	2808	6 24.0 24.6
07	2849	2890	2932	2973	3015	3056	3098	3139	3181	3222	7 28.0 28.7
08	3264	3306	3347	3389	3431	3472	3514	3556	3597	3639	8 32.0 32.8
09	3681	3723	3765	3806	3848	3890	3932	3974	4016	4058	9 36.0 36.9
2.10	4.4100	4142	4184	4226	4268	4310	4352	4394	4437	4479	42 43
11	4521	4563	4605	4648	4690	4732	4775	4817	4859	4902	3 12.6 12.9
12	4944	4986	5029	5071	5114	5156	5199	5241	5284	5326	4 16.8 17.2
13	5369	5412	5454	5497	5540	5582	5625	5668	5710	5753	5 21.0 21.5
14	5796	5839	5882	5924	5967	6010	6053	6096	6139	6182	6 25.2 25.8
15	4.6225	6268	6311	6354	6397	6440	6483	6526	6570	6613	7 29.4 30.1
16	6656	6699	6742	6786	6829	6872	6916	6959	7002	7046	8 33.6 34.4
17	7089	7132	7176	7219	7263	7306	7350	7393	7437	7480	44 45
18	7524	7568	7611	7655	7699	7742	7786	7830	7873	7917	1 4.4 4.5
19	7961	8005	8049	8092	8136	8180	8224	8268	8312	8356	2 8.8 9.0
2.20	4.8400	8444	8488	8532	8576	8620	8664	8708	8753	8797	43 44
21	8841	8885	8929	8974	9018	9062	9107	9151	9195	9240	5 22.0 22.5
22	9284	9328	9373	9417	9462	9506	9551	9595	9640	9684	6 26.4 27.0
23	4.9729	9774	9818	9863	9908	9952	9997	0042	0086	0131	7 30.8 31.5
24	5.0176	0221	0266	0310	0355	0400	0445	0490	0535	0580	8 35.2 36.0
25	5.0625	0670	0715	0760	0805	0850	0895	0940	0986	1031	9 39.6 40.5
26	1076	1121	1166	1212	1257	1302	1348	1393	1438	1484	46 47
27	1529	1574	1620	1665	1711	1756	1802	1847	1893	1938	1 4.6 4.7
28	1984	2030	2075	2121	2167	2212	2258	2304	2349	2395	2 9.2 9.4
29	2441	2487	2533	2578	2624	2670	2716	2762	2808	2854	3 13.8 14.1
2.30	5.2900	2946	2992	3038	3084	3130	3176	3222	3269	3315	46 47
31	3361	3407	3453	3500	3546	3592	3639	3685	3731	3778	6 27.6 28.2
32	3824	3870	3917	3963	4010	4056	4103	4149	4196	4242	7 32.2 32.9
33	4289	4336	4382	4429	4476	4522	4569	4616	4662	4709	8 36.8 37.6
34	4756	4803	4850	4896	4943	4990	5037	5084	5131	5178	48 49
35	5.5225	5272	5319	5366	5413	5460	5507	5554	5602	5649	1 4.8 4.9
36	5696	5743	5790	5838	5885	5932	5980	6027	6074	6122	2 9.6 9.8
37	6169	6216	6264	6311	6359	6406	6454	6501	6549	6596	3 14.4 14.7
38	6644	6692	6739	6787	6835	6882	6930	6978	7025	7073	4 19.2 19.6
39	7121	7169	7217	7264	7312	7360	7408	7456	7504	7552	5 24.0 24.5
2.40	5.7600	7648	7696	7744	7792	7840	7888	7936	7985	8033	48 49
41	8081	8129	8177	8226	8274	8322	8371	8419	8467	8516	1 5.0 5.1
42	8564	8612	8661	8709	8758	8806	8855	8903	8952	9000	50 51
43	9049	9098	9146	9195	9244	9292	9341	9390	9438	9487	2 10.0 10.2
44	5.9536	9585	9634	9682	9731	9780	9829	9878	9927	9976	3 15.0 15.3
45	6.0025	0074	0123	0172	0221	0270	0319	0368	0418	0467	4 20.0 20.4
46	0516	0565	0614	0664	0713	0762	0812	0861	0910	0960	5 25.0 25.5
47	1009	1058	1108	1157	1207	1256	1306	1355	1405	1454	6 30.0 30.6
48	1504	1554	1603	1653	1703	1752	1802	1852	1901	1951	7 35.0 35.7
49	2001	2051	2101	2150	2200	2250	2300	2350	2400	2450	8 40.0 40.8
2.50	6.2500	2550	2600	2650	2700	2750	2800	2850	2901	2951	9 45.0 45.9
N	N ² 0	1	2	3	4	5	6	7	8	9	P P

Moving the decimal point *one* place in N is equivalent to moving it *two* places in N².

Squares of Numbers from 2.500 to 3.000

N	N ²	0	1	2	3	4	5	6	7	8	9	P	P	
2.50	6.2500	2550	2600	2650	2700	2750	2800	2850	2900	2950		50	51	
51	3001	3051	2101	3152	3202	3252	3303	3353	3403	3454		1	5.0	5.1
52	3504	3554	3605	3655	3706	3756	3807	3857	3908	3958		2	10.0	10.2
53	4009	4060	4110	4161	4212	4262	4313	4364	4414	4465		3	15.0	15.3
54	4516	4567	4618	4668	4719	4770	4821	4872	4923	4974		4	20.0	20.4
55	6.5025	5076	5127	5178	5229	5280	5331	5382	5434	5485		5	25.0	25.5
56	5536	5587	5638	5690	5741	5792	5844	5895	5946	5998		6	30.0	30.6
57	6049	6100	6152	6203	6255	6306	6358	6409	6461	6512		7	35.0	35.7
58	6564	6616	6667	6719	6771	6822	6874	6926	6977	7029		8	40.0	40.8
59	7081	7133	7185	7236	7288	7340	7392	7444	7496	7548		9	45.0	45.9
2.60	6.7600	7652	7704	7756	7808	7860	7912	7964	8017	8069		52	53	
61	8121	8173	8225	8278	8330	8382	8435	8487	8539	8592		1	5.2	5.3
62	8644	8696	8749	8801	8854	8906	8959	9011	9064	9116		2	10.4	10.6
63	9169	9222	9274	9327	9380	9432	9485	9538	9590	9643		3	15.6	15.9
64	6.9696	9749	9802	9854	9907	9960	0013	0066	0119	0172		4	20.8	21.2
65	7.0225	0278	0331	0384	0437	0490	0543	0596	0650	0703		5	26.0	26.5
66	0756	0809	0862	0916	0969	1022	1076	1129	1182	1236		6	31.2	31.8
67	1289	1342	1396	1449	1503	1556	1610	1663	1717	1770		54	55	
68	1824	1878	1931	1985	2039	2092	2146	2200	2253	2307		1	5.4	5.5
69	2361	2415	2469	2522	2576	2630	2684	2738	2792	2846		2	10.8	11.0
2.70	7.2900	2954	3008	3062	3116	3170	3224	3278	3333	3387		56	57	
71	3441	3495	3549	3604	3658	3712	3767	3821	3875	3930		1	5.6	5.7
72	3984	4038	4093	4147	4202	4256	4311	4365	4420	4474		2	11.2	11.4
73	4529	4584	4638	4693	4748	4802	4857	4912	4966	5021		3	16.8	17.1
74	5076	5131	5186	5240	5295	5350	5405	5460	5515	5570		4	21.6	22.0
75	7.5625	5680	5735	5790	5845	5900	5955	6010	6066	6121		5	27.0	27.5
76	6176	6231	6286	6342	6397	6452	6508	6563	6618	6674		6	32.4	33.0
77	6729	6784	6840	6895	6951	7006	7062	7117	7173	7228		7	37.8	38.5
78	7284	7340	7395	7451	7507	7562	7618	7674	7729	7785		8	43.2	44.0
79	7841	7897	7953	8008	8064	8120	8176	8232	8288	8344		9	48.6	49.5
2.80	7.8400	8456	8512	8568	8624	8680	8736	8792	8849	8905		58	59	
81	8961	9017	9073	9130	9186	9242	9299	9355	9411	9468		1	5.8	5.9
82	7.9524	9580	9637	9693	9750	9806	9863	9919	9976	0032		2	11.6	11.8
83	8.0089	0146	0202	0259	0316	0372	0429	0486	0542	0599		3	17.4	17.7
84	0656	0713	0770	0826	0883	0940	0997	1054	1111	1168		4	23.2	23.6
85	8.1225	1282	1339	1396	1453	1510	1567	1624	1682	1739		5	29.0	29.5
86	1796	1853	1910	1968	2025	2082	2140	2197	2254	2312		6	34.8	35.4
87	2369	2426	2484	2541	2599	2656	2714	2771	2829	2886		7	40.6	41.3
88	2944	3002	3059	3117	3175	3232	3290	3348	3405	3463		8	46.4	47.2
89	3521	3579	3637	3694	3752	3810	3868	3926	3984	4042		9	52.2	53.1
2.90	8.4100	4158	4216	4274	4332	4390	4448	4506	4565	4623		60	61	
91	4681	4739	4797	4856	4914	4972	5031	5089	5147	5206		1	6.0	6.1
92	5264	5322	5381	5439	5498	5556	5615	5673	5732	5790		2	12.0	12.2
93	5849	5908	5966	6025	6084	6142	6201	6260	6318	6377		3	18.0	18.3
94	6436	6495	6554	6612	6671	6730	6789	6848	6907	6966		4	24.0	24.4
95	8.7025	7084	7143	7202	7261	7320	7379	7438	7498	7557		5	30.0	30.5
96	7616	7675	7734	7794	7853	7912	7972	8031	8090	8150		6	36.0	36.6
97	8209	8268	8328	8387	8447	8506	8566	8625	8685	8744		7	42.0	42.7
98	8804	8864	8923	8983	9043	9102	9162	9222	9281	9341		8	48.0	48.8
99	8.9401	9461	9521	9580	9640	9700	9760	9820	9880	9940		9	54.0	54.9
3.00	9.0000	0060	0120	0180	0240	0300	0360	0420	0481	0541				
N	N ²	0	1	2	3	4	5	6	7	8	9	P	P	

Moving the decimal point *one* place in N is equivalent to moving it *two* places in N².

Squares of Numbers from 3.000 to 3.500

N	N ²	0	1	2	3	4	5	6	7	8	9	P	P	
3.00	9.0000	0060	0120	0180	0240	0300	0360	0420	0480	0540		60	61	
01	0601	0661	0721	0782	0842	0902	0963	1023	1083	1144		1	6.0	6.1
02	1204	1264	1325	1385	1446	1506	1567	1627	1688	1748		2	12.0	12.2
03	1809	1870	1930	1991	2052	2112	2173	2234	2294	2355		3	18.0	18.3
04	2416	2477	2538	2598	2659	2720	2781	2842	2903	2964		4	24.0	24.4
05	9.3025	3086	3147	3208	3269	3330	3391	3452	3514	3575		5	30.0	30.5
06	3636	3697	3758	3820	3881	3942	4004	4065	4126	4188		6	36.0	36.6
07	4249	4310	4372	4433	4495	4556	4618	4679	4741	4802		7	42.0	42.7
08	4864	4926	4987	5049	5111	5172	5234	5296	5357	5419		8	48.0	48.8
09	5481	5543	5605	5666	5728	5790	5852	5914	5976	6038		9	54.0	54.9
3.10	9.6100	6162	6224	6286	6348	6410	6472	6534	6597	6659		62	63	
11	6721	6783	6845	6908	6970	7032	7095	7157	7219	7282		3	18.6	18.9
12	7344	7406	7469	7531	7594	7656	7719	7781	7844	7906		4	24.8	25.2
13	7969	8032	8094	8157	8220	8282	8345	8408	8470	8533		5	31.0	31.5
14	8596	8659	8722	8784	8847	8910	8973	9036	9099	9162		7	43.4	44.1
15	9.9225	9288	9351	9414	9477	9540	9603	9666	9730	9793		8	49.6	50.4
16	9.9856	9919	9982	0046	0109	0172	0236	0299	0362	0426		9	55.8	56.7
17	10.0489	0552	0616	0679	0743	0806	0870	0933	0997	1060		64	65	
18	1124	1188	1251	1315	1379	1442	1506	1570	1633	1697		1	6.4	6.5
19	1761	1825	1889	1952	2016	2080	2144	2208	2272	2336		2	12.8	13.0
3.20	10.2400	2404	2528	2592	2656	2720	2784	2848	2913	2977		3	19.2	19.5
21	3041	3105	3169	3234	3298	3362	3427	3491	3555	3620		5	32.0	32.5
22	3684	3748	3813	3877	3942	4006	4071	4135	4200	4264		6	38.4	39.0
23	4329	4394	4458	4523	4588	4652	4717	4782	4846	4911		7	44.8	45.5
24	4976	5041	5106	5170	5235	5300	5365	5430	5495	5560		8	51.2	52.0
25	10.5625	5690	5755	5820	5885	5950	6015	6080	6146	6211		9	57.6	58.5
26	6276	6341	6406	6472	6537	6602	6668	6733	6798	6864		66	67	
27	6929	6994	7060	7125	7191	7256	7322	7387	7453	7518		2	13.2	13.4
28	7584	7650	7715	7781	7847	7912	7978	8044	8109	8175		3	19.8	20.1
29	8241	8307	8373	8438	8504	8570	8636	8702	8768	8834		4	26.4	26.8
3.30	10.8900	8966	9032	9098	9164	9230	9296	9362	9429	9495		5	33.0	33.5
31	10.9501	9627	9693	9760	9826	9892	9959	0025	0091	0158		7	46.2	46.9
32	11.0224	0290	0357	0423	0490	0556	0623	0689	0756	0822		8	52.8	53.6
33	6889	0956	1022	1089	1156	1222	1289	1356	1422	1489		9	59.4	60.3
34	1556	1623	1690	1756	1823	1890	1957	2024	2091	2158		68	69	
35	11.2225	2292	2359	2426	2493	2560	2627	2694	2762	2829		1	6.8	6.9
36	2896	2963	3030	3098	3165	3232	3300	3367	3434	3502		2	13.6	13.8
37	3569	3636	3704	3771	3839	3906	3974	4041	4109	4176		3	20.4	20.7
38	4244	4312	4379	4447	4515	4582	4650	4718	4785	4853		4	27.2	27.6
39	4921	4989	5057	5124	5192	5260	5328	5396	5464	5532		6	40.8	41.4
3.40	11.5600	5668	5736	5804	5872	5940	6008	6076	6145	6213		8	54.4	55.2
41	6281	6349	6417	6486	6554	6622	6691	6759	6827	6896		9	61.2	62.1
42	6964	7032	7101	7169	7238	7306	7375	7443	7512	7580		70	71	
43	7649	7718	7786	7855	7924	7992	8061	8130	8198	8267		1	7.0	7.1
44	8336	8405	8474	8542	8611	8680	8749	8818	8887	8956		2	14.0	14.2
45	11.9025	9094	9163	9232	9301	9370	9439	9508	9578	9647		3	21.0	21.3
46	11.9716	9785	9854	9924	9993	0062	0132	0201	0270	0340		4	28.0	28.4
47	12.0409	0478	0548	0617	0687	0756	0826	0895	0965	1034		5	35.0	35.5
48	1104	1174	1243	1313	1383	1452	1522	1592	1661	1731		7	49.0	49.7
49	1801	1871	1941	2010	2080	2150	2220	2290	2360	2430		8	56.0	56.8
3.50	12.2500	2570	2640	2710	2780	2850	2920	2990	3061	3131		9	63.0	63.9
N	N ²	0	1	2	3	4	5	6	7	8	9	P	P	

Moving the decimal point *one* place in N is equivalent to moving it *two* places in N².

TABLE VII

TABLE FOR TRANSFORMING ANGLES

To change from Minutes and Seconds into the Decimal Parts of a Degree

TO CHANGE FROM DECIMAL PARTS OF A DEGREE INTO MINUTES AND SECONDS

$0^{\circ}0.000 = 0^{\circ}.000 = 0''$	$0^{\circ}.20 = 12'0 = 12'$	$0^{\circ}.60 = 36'0 = 36'$
$0^{\circ}.0001 = 0^{\circ}.006 = 0''.36$	$0^{\circ}.21 = 12'.6 = 12'36''$	$0^{\circ}.61 = 36'.6 = 36'36''$
$0^{\circ}.0002 = 0^{\circ}.012 = 0''.72$	$0^{\circ}.22 = 13'.2 = 13'12''$	$0^{\circ}.62 = 37'.2 = 37'12''$
$0^{\circ}.0003 = 0^{\circ}.018 = 1''.08$	$0^{\circ}.23 = 13'.8 = 13'48''$	$0^{\circ}.63 = 37'.8 = 37'48''$
$0^{\circ}.0004 = 0^{\circ}.024 = 1''.44$	$0^{\circ}.24 = 14'.4 = 14'24''$	$0^{\circ}.64 = 38'.4 = 38'24''$
$0^{\circ}.0005 = 0^{\circ}.030 = 1''.80$	$0^{\circ}.25 = 15'.0 = 15'$	$0^{\circ}.65 = 39'.0 = 39'$
$0^{\circ}.0006 = 0^{\circ}.036 = 2''.16$	$0^{\circ}.26 = 15'.6 = 15'36''$	$0^{\circ}.66 = 39'.6 = 39'36''$
$0^{\circ}.0007 = 0^{\circ}.042 = 2''.52$	$0^{\circ}.27 = 16'.2 = 16'12''$	$0^{\circ}.67 = 40'.2 = 40'12''$
$0^{\circ}.0008 = 0^{\circ}.048 = 2''.88$	$0^{\circ}.28 = 16'.8 = 16'48''$	$0^{\circ}.68 = 40'.8 = 40'48''$
$0^{\circ}.0009 = 0^{\circ}.054 = 3''.24$	$0^{\circ}.29 = 17'.4 = 17'24''$	$0^{\circ}.69 = 41'.4 = 41'24''$
$0^{\circ}.0010 = 0^{\circ}.060 = 3''.60$	$0^{\circ}.30 = 18'.0 = 18'$	$0^{\circ}.70 = 42'.0 = 42'$
$0^{\circ}.001 = 0^{\circ}.06 = 3''.6$	$0^{\circ}.31 = 18'.6 = 18'36''$	$0^{\circ}.71 = 42'.6 = 42'36''$
$0^{\circ}.002 = 0^{\circ}.12 = 7''.2$	$0^{\circ}.32 = 19'.2 = 19'12''$	$0^{\circ}.72 = 43'.2 = 43'12''$
$0^{\circ}.003 = 0^{\circ}.18 = 10''.8$	$0^{\circ}.33 = 19'.8 = 19'48''$	$0^{\circ}.73 = 43'.8 = 43'48''$
$0^{\circ}.004 = 0^{\circ}.24 = 14''.4$	$0^{\circ}.34 = 20'.4 = 20'24''$	$0^{\circ}.74 = 44'.4 = 44'24''$
$0^{\circ}.005 = 0^{\circ}.30 = 18''.0$	$0^{\circ}.35 = 21'.0 = 21'$	$0^{\circ}.75 = 45'.0 = 45'$
$0^{\circ}.006 = 0^{\circ}.36 = 21''.6$	$0^{\circ}.36 = 21'.6 = 21'36''$	$0^{\circ}.76 = 45'.6 = 45'36''$
$0^{\circ}.007 = 0^{\circ}.42 = 25''.2$	$0^{\circ}.37 = 22'.2 = 22'12''$	$0^{\circ}.77 = 46'.2 = 46'12''$
$0^{\circ}.008 = 0^{\circ}.48 = 28''.8$	$0^{\circ}.38 = 22'.8 = 22'48''$	$0^{\circ}.78 = 46'.8 = 46'48''$
$0^{\circ}.009 = 0^{\circ}.54 = 32''.4$	$0^{\circ}.39 = 23'.4 = 23'24''$	$0^{\circ}.79 = 47'.4 = 47'24''$
$0^{\circ}.010 = 0^{\circ}.60 = 36''.0$	$0^{\circ}.40 = 24'.0 = 24'$	$0^{\circ}.80 = 48'.0 = 48'$
$0^{\circ}.01 = 0^{\circ}.6 = 36''$	$0^{\circ}.41 = 24'.6 = 24'36''$	$0^{\circ}.81 = 48'.6 = 48'36''$
$0^{\circ}.02 = 1'.2 = 7'12''$	$0^{\circ}.42 = 25'.2 = 25'12''$	$0^{\circ}.82 = 49'.2 = 49'12''$
$0^{\circ}.03 = 1'.8 = 7'48''$	$0^{\circ}.43 = 25'.8 = 25'48''$	$0^{\circ}.83 = 49'.8 = 49'48''$
$0^{\circ}.04 = 2'.4 = 2'24''$	$0^{\circ}.44 = 26'.4 = 26'24''$	$0^{\circ}.84 = 50'.4 = 50'24''$
$0^{\circ}.05 = 3'.0 = 3'$	$0^{\circ}.45 = 27'.0 = 27'$	$0^{\circ}.85 = 51'.0 = 51'$
$0^{\circ}.06 = 3'.6 = 3'36''$	$0^{\circ}.46 = 27'.6 = 27'36''$	$0^{\circ}.86 = 51'.6 = 51'36''$
$0^{\circ}.07 = 4'.2 = 4'12''$	$0^{\circ}.47 = 28'.2 = 28'12''$	$0^{\circ}.87 = 52'.2 = 52'12''$
$0^{\circ}.08 = 4'.8 = 4'48''$	$0^{\circ}.48 = 28'.8 = 28'48''$	$0^{\circ}.88 = 52'.8 = 52'48''$
$0^{\circ}.09 = 5'.4 = 5'24''$	$0^{\circ}.49 = 29'.4 = 29'24''$	$0^{\circ}.89 = 53'.4 = 53'24''$
$0^{\circ}.10 = 6'.0 = 6'$	$0^{\circ}.50 = 30'.0 = 30'$	$0^{\circ}.90 = 54'.0 = 54'$
$0^{\circ}.11 = 6'.6 = 6'36''$	$0^{\circ}.51 = 30'.6 = 30'36''$	$0^{\circ}.91 = 54'.6 = 54'36''$
$0^{\circ}.12 = 7'.2 = 7'12''$	$0^{\circ}.52 = 31'.2 = 31'12''$	$0^{\circ}.92 = 55'.2 = 55'12''$
$0^{\circ}.13 = 7'.8 = 7'48''$	$0^{\circ}.53 = 31'.8 = 31'48''$	$0^{\circ}.93 = 55'.8 = 55'48''$
$0^{\circ}.14 = 8'.4 = 8'24''$	$0^{\circ}.54 = 32'.4 = 32'24''$	$0^{\circ}.94 = 56'.4 = 56'24''$
$0^{\circ}.15 = 9'.0 = 9'$	$0^{\circ}.55 = 33'.0 = 33'$	$0^{\circ}.95 = 57'.0 = 57'$
$0^{\circ}.16 = 9'.6 = 9'36''$	$0^{\circ}.56 = 33'.6 = 33'36''$	$0^{\circ}.96 = 57'.6 = 57'36''$
$0^{\circ}.17 = 10'.2 = 10'12''$	$0^{\circ}.57 = 34'.2 = 34'12''$	$0^{\circ}.97 = 58'.2 = 58'12''$
$0^{\circ}.18 = 10'.8 = 10'48''$	$0^{\circ}.58 = 34'.8 = 34'48''$	$0^{\circ}.98 = 58'.8 = 58'48''$
$0^{\circ}.19 = 11'.4 = 11'24''$	$0^{\circ}.59 = 35'.4 = 35'24''$	$0^{\circ}.99 = 59'.4 = 59'24''$
$0^{\circ}.20 = 12'.0 = 12'$	$0^{\circ}.60 = 36'.0 = 36'$	$1^{\circ}.00 = 60'.0 = 60'$

TABLE VIII—CONSTANTS

MATHEMATICAL CONSTANTS

	LOGARITHM
Ratio of circumference of a circle to its diameter $\pi = 3.14159265$	0.49714987
One radian = $57^\circ.29578$	1.75812263
One radian = $3437'.74677$	3.53627388
One radian = $206264''.806$	5.31442513
One degree = 0.01745329 radians	8.24187737 - 10
One minute = 0.00029089 radians	6.46372612 - 10
One second = 0.00000485 radians	4.68557487 - 10
Sin $1'' = 0.00000485$	4.68557487 - 10
Base of natural logarithms $e = 2.71828183$	0.43429448
Modulus of common logarithms $M = 0.43429448$	9.63778431 - 10

RELATION BETWEEN ENGLISH AND METRIC STANDARDS OF LENGTH

1 inch = 2.54001 centimeters,	1 centimeter = 0.393700 inches.
1 foot = 0.304801 meters,	1 meter = 3.28083 feet.
1 mile = 1.60935 kilometers,	1 kilometer = 0.62137 miles.
1 nautical mile = 6080.27 feet = 1.85325 kilometers.	

GEODETIC, ASTRONOMICAL, AND PHYSICAL CONSTANTS

Equatorial semi-diameter of the Earth (Clarke),	3963.3 miles.
Polar semi-diameter of the Earth (Clarke),	3949.8 miles.
Equatorial horizontal parallax of Sun,	8''.80.
Mean distance of Sun from the Earth,	92,897,000 miles.
Mean parallax of the moon,	57' 2''.
Mean distance of the Moon from the Earth,	238,840 miles.
Velocity of light in vacuum (Newcomb),	186,326 miles per second.
Velocity of sound in dry air at 0° centigrade,	1090 feet per second.

TABLE IX
THREE-PLACE VALUES OF THE
TRIGONOMETRIC FUNCTIONS

Angle	Sin	Tan	Sec	Csc	Cot	Cos	
0°	.000	.000	1.000	∞	∞	1.000	90°
1	.017	.017	1.000	57.299	57.299	1.000	89
2	.035	.035	1.001	28.654	28.636	.999	88
3	.052	.052	1.001	19.107	19.081	.999	87
4	.070	.070	1.002	14.336	14.301	.998	86
5	.087	.087	1.004	11.474	11.430	.996	85
6	.105	.105	1.006	9.567	9.514	.995	84
7	.122	.123	1.008	8.206	8.144	.993	83
8	.139	.141	1.010	7.185	7.115	.990	82
9	.156	.158	1.012	6.392	6.314	.988	81
10	.174	.176	1.015	5.759	5.671	.985	80
11	.191	.194	1.019	5.241	5.145	.982	79
12	.208	.213	1.022	4.810	4.705	.978	78
13	.225	.231	1.026	4.445	4.331	.974	77
14	.242	.249	1.031	4.134	4.001	.970	76
15	.259	.268	1.035	3.864	3.732	.966	75
16	.276	.287	1.040	3.628	3.487	.961	74
17	.292	.306	1.046	3.420	3.271	.956	73
18	.309	.325	1.051	3.236	3.078	.951	72
19	.326	.344	1.058	3.072	2.904	.946	71
20	.342	.364	1.064	2.924	2.747	.940	70
21	.358	.384	1.071	2.790	2.605	.934	69
22	.375	.404	1.079	2.669	2.475	.927	68
23	.391	.424	1.086	2.559	2.356	.921	67
24	.407	.445	1.095	2.459	2.246	.914	66
25	.423	.466	1.103	2.366	2.145	.906	65
26	.438	.488	1.113	2.281	2.050	.899	64
27	.454	.510	1.122	2.203	1.963	.891	63
28	.469	.532	1.133	2.130	1.881	.883	62
29	.485	.554	1.143	2.063	1.804	.875	61
30	.500	.577	1.155	2.000	1.732	.866	60
31	.515	.601	1.167	1.942	1.664	.857	59
32	.530	.625	1.179	1.887	1.600	.848	58
33	.545	.649	1.192	1.836	1.540	.839	57
34	.559	.675	1.206	1.788	1.483	.829	56
35	.574	.700	1.221	1.743	1.428	.819	55
36	.588	.727	1.236	1.701	1.376	.809	54
37	.602	.754	1.252	1.662	1.327	.799	53
38	.616	.781	1.269	1.624	1.280	.788	52
39	.629	.810	1.287	1.589	1.235	.777	51
40	.643	.839	1.305	1.556	1.192	.766	50
41	.656	.869	1.325	1.524	1.150	.755	49
42	.669	.900	1.346	1.494	1.111	.743	48
43	.682	.933	1.367	1.466	1.072	.731	47
44	.695	.966	1.390	1.440	1.036	.719	46
45°	.707	1.000	1.414	1.414	1.000	.707	45°
	Cos	Cot	Csc	Sec	Tan	Sin	Angle

TABLE X
THREE-PLACE LOGARITHMS OF NUMBERS

N	O	1	2	3	4	5	6	7	8	9
1	000	041	079	114	146	176	204	230	255	279
2	301	322	342	362	380	398	415	431	447	462
3	477	491	505	519	532	544	556	568	580	591
4	602	613	623	634	644	653	663	672	681	690
5	699	708	716	724	732	740	748	756	763	771
6	778	785	792	799	806	813	820	826	833	839
7	845	851	857	863	869	875	881	887	892	898
8	903	909	914	919	924	929	935	940	945	949
9	954	959	964	969	973	978	982	987	991	996
10	000	004	009	013	017	021	025	029	033	037
11	041	045	049	053	057	061	065	068	072	076
12	079	083	086	090	093	097	100	104	107	111
13	114	117	121	124	127	130	134	137	140	143
14	146	149	152	155	158	161	164	167	170	173
15	176	179	182	185	188	190	193	196	199	201
16	204	207	210	212	215	218	220	223	225	228
17	230	233	236	238	241	243	246	248	250	253
18	255	258	260	263	265	267	270	272	274	277
19	279	281	283	286	288	290	292	295	297	299

TABLE XI

THREE-PLACE LOGARITHMS OF THE
TRIGONOMETRIC FUNCTIONS

Angle	L Sin	d	L Tan	c d	L Cot	L Cos	d	
0°	—		—		—	10.000		90°
1	8.242		8.242		1.758	10.000		89
2	8.543	301	8.543	301	1.457	10.000		88
3	8.719	176	8.719	176	1.281	9.999		87
4	8.844	125	8.845	126	1.155	9.999		86
5	8.940	96	8.942	97	1.058	9.998		85
6	9.019	79	9.022	80	0.978	9.998		84
7	9.086	67	9.089	67	0.911	9.997		83
8	9.144	58	9.148	59	0.852	9.996	I	82
9	9.194	50	9.200	52	0.800	9.995	I	81
10	9.240	46	9.246	46	0.754	9.993	2	80
11	9.281	41	9.289	43	0.711	9.992	I	79
12	9.318	37	9.327	38	0.673	9.990	2	78
13	9.352	34	9.363	36	0.637	9.989	I	77
14	9.384	32	9.397	34	0.603	9.987	2	76
15	9.413	29	9.428	31	0.572	9.985	2	75
16	9.440	27	9.458	30	0.543	9.983	2	74
17	9.466	26	9.485	27	0.515	9.981	2	73
18	9.490	24	9.512	27	0.488	9.978	3	72
19	9.513	23	9.537	25	0.463	9.976	2	71
20	9.534	21	9.561	24	0.439	9.973	3	70
21	9.554	20	9.584	23	0.416	9.970	3	69
22	9.574	20	9.606	22	0.394	9.967	3	68
23	9.592	18	9.628	22	0.372	9.964	3	67
24	9.609	17	9.649	21	0.351	9.961	3	66
25	9.626	17	9.669	20	0.331	9.957	4	65
26	9.642	16	9.688	19	0.312	9.954	3	64
27	9.657	15	9.707	19	0.293	9.950	4	63
28	9.672	15	9.726	19	0.274	9.946	4	62
29	9.686	14	9.744	18	0.256	9.942	4	61
30	9.699	13	9.761	17	0.239	9.938	4	60
31	9.712	13	9.779	18	0.221	9.933	5	59
32	9.724	12	9.796	17	0.204	9.928	5	58
33	9.736	12	9.813	17	0.187	9.924	4	57
34	9.748	12	9.829	16	0.171	9.919	5	56
35	9.759	11	9.845	16	0.155	9.913	6	55
36	9.769	10	9.861	16	0.139	9.908	5	54
37	9.779	10	9.877	16	0.123	9.902	6	53
38	9.789	10	9.893	15	0.107	9.897	5	52
39	9.799	10	9.908	15	0.092	9.891	6	51
40	9.808	9	9.924	15	0.076	9.884	7	50
41	9.817	9	9.939	15	0.061	9.878	6	49
42	9.826	8	9.954	16	0.046	9.871	7	48
43	9.834	8	9.970	15	0.030	9.864	7	47
44	9.842	8	9.985	15	0.015	9.857	7	46
45°	9.849	7	10.000	15	0.000	9.849	8	45°
	L Cos	d	L Cot	c d	L Tan	L Sin	d	Angle

Right Triangles

$$\log \pi = 4.9715 \\ \pi = 3.14159$$

$$A + B = 90^\circ$$

$$a^2 + b^2 = c^2$$

$$\text{Sine of } A = \frac{\text{opp. side}}{\text{hyp}} = \frac{a}{c}$$

$$\text{Cos } A = \frac{\text{adj. side}}{\text{hyp}} = \frac{b}{c}$$

$$\text{Tan } A = \frac{\text{opp. side}}{\text{adj. side}} = \frac{a}{b}$$

$$\text{Cot } A = \frac{\text{adj. side}}{\text{opp. side}} = \frac{b}{a}$$

$$\text{Sec } A = \frac{\text{hyp}}{\text{adj. side}} = \frac{c}{b}$$

$$\text{Cosec } A = \frac{\text{hyp}}{\text{opp. side}} = \frac{c}{a}$$

$$\text{Sin } A \text{ Cosec } A = 1.$$

$$\text{Cos } A \text{ Sec } A = 1.$$

$$\text{Tan } A \text{ cot } A = 1.$$

$$\text{Tan } A = \frac{\text{Sin } A}{\text{Cos } A}$$

$$\text{Cot } A = \frac{\text{Cos } A}{\text{Sin } A}$$

$$\text{Sin}^2 A + \text{Cos}^2 A = 1.$$

1. Sine or Cos never greater than unity

I given 2 sides of Δ including rt. \angle (Two legs)

$$\text{Tan } A = \frac{a}{b}, c = \sqrt{a^2 + b^2}, B = 90^\circ - A$$

II

given one leg and hyp. - a, c

$$\text{Sin } A = \frac{a}{c}, b = a \text{ cot } A = c \text{ cos } A, B = 90^\circ - A$$

III given 1. hyp. and one acute \angle - A, C

$$b = a \text{ cot } A, c = \frac{a}{\text{Sin } A} = \frac{b}{\text{Cos } A}, B = 90^\circ - A$$

IV given hyp and one acute \angle - A, C

$$a = c \text{ Sin } A, b = c \text{ Cos } A, B = 90^\circ - A$$



$$\text{Law of sines} = \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{law of Tan} = \frac{a-b}{a+b} = \frac{\tan \frac{1}{2}(A-B)}{\tan \frac{1}{2}(A+B)}$$

$$\text{law of Cos} = a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area} = S = \sqrt{s(s-a)(s-b)(s-c)}$$

$$\text{Radius} = r = \frac{\sqrt{s(s-a)(s-b)(s-c)}}{s}$$

$$\text{Mollweide's Formula} = \frac{a-b}{c} = \frac{\sin \frac{1}{2}(A-B)}{\cos \frac{1}{2}C}$$

I Given 2 LS + included side
law of sines
check: Mollweide's formula

II Given 3 sides

$$s = \frac{1}{2}(a+b+c), r = \sqrt{\frac{(s-a)(s-b)(s-c)}{s}}$$
$$\tan \frac{1}{2}A = \frac{r}{s-a}, \tan \frac{1}{2}B = \frac{r}{s-b}, \tan \frac{1}{2}C = \frac{r}{s-c}$$
$$\text{check: } A + B + C = 180^\circ$$

III Given 2 sides + included L

law of Tan.

law of sin

check: Mollweide's Formula

IV Given 2 sides and L opposite

$a > b$ = law of sines

$a < b$ = no solution

$a = b$ = two solutions

